C4725-1 3/18/82

January 31, 1982
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The business magazine of the farm and industrial equipment industry

red book

Tractor and equipment specifications
Hydraulic components data
Nebraska test reports
Full contents
page A2

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January 31, 1982 • Vo. 97 • No. 3

Implement & Tractor

The Business Magazine of the Farm and Industrial Equipment Industry

66th annual red book issue

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IMPLEMENT & TRACTOR
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and circulation correspondence
should be addressed to:
9221 Quivira Rd.
P.O. Box 12901
Overland Park, Kan. 66212
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Intertec OLPK

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Fulfillment & Production
(Regional advertising sales offices
listed on ad index page.)

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INTERTEC PUBLISHING CORP.

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Second class postage paid at Shawnee Mission, KS 66201. Postmaster: Return Form 3579 to IMPLEMENT & TRACTOR, P.O. Box 12901, Overland Park, KS 66212.

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IMPLEMENT & TRACTOR (USPS 461-750), with which is combined Farm Implement News, is published twice monthly except in January and March, when third issues are published, and in July and December, when one issue only is published, by INTERTEC PUBLISHING CORP., 9221 Quivira Rd., Overland Park, KS 66215 (a suburb of Kansas City, Mo.).

Subscription Information—Implement & Tractor is edited for persons in the farm and industrial equipment industry who function in the areas of retail sales and service, distribution sales and service, marketing, engineering, financing, manufacturing and general maintenance. Subscription prices to qualified subscribers: U.S. one year—$10, two years—$15; elswhere including Canada, one year—$17, two years—$25. Subscription prices to all others: U.S. one year—$34, two years $68; elsewhere including Canada, one year—$39, two years $78. Single copies, $2, except Annual Statistical Number, $4; Product File issue, $5; Red Book issue, $5. Adjustment necessitated by subscription termination at single copy rate. Extra charge for service on back issues. Allow 6-8 weeks for change of address and new subscriptions.

For addresses of manufacturers whose products are listed in this edition, refer first to advertiser's index and obtain address from advertisement. For non-advertisers and companies that do not show an address on their advertisement, refer to company name and address listing in I&T PRODUCT FILE (Annual March 31 issue).

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This section includes only those 1981 Nebraska Tests for which the printed form is available December 31, 1981. The 1981 Fall Series tests will be reproduced at a later date.

The Nebraska Tractor Test Law

Purpose of the Law—The Nebraska Tractor Test Law originated in 1919 for the purpose of verifying advertising claims on tractors offered for sale to Nebraska farmers.

Its position as the only independent test laboratory in the United States devoted to the evaluation of tractor performance proved of unique value to the industry. The Agricultural Tractor Test Code used in the Nebraska Tests was developed with the approval and assistance of the American Society of Agricultural Engineers and the Society of Automotive Engineers, and is revised and updated periodically as the need arises. The Test Code (ASAE S209.4 or SAE J708c) is published in the ASAE Yearbook and SAE Handbook.

Provisions of the Law—Stated briefly, the Nebraska Tractor Test Law provides:

That a stock unit of each agricultural tractor model sold in Nebraska shall be tested and passed upon by a board of three engineers under the supervision and direction of the University of Nebraska. Each tractor must be certified as a stock model and will be equipped with the common power consuming accessories. An official representative of the manufacturer is present during the test to see that the performance meets company standards.

The Department of Agriculture shall deny to any manufacturer the right to do business in the State on complaint of two or more bona fide customers that the company has failed to maintain an adequate service station with a full supply of replacement parts within the state and within reasonable distance of customers.

The law further states that it shall be unlawful to publish excerpts from any official test in advertising material without publishing the entire report.

The provisions of the Nebraska Test Law do not apply to any tractor the engine of which develops less than 20 horsepower; or to tractors manufactured, sold and used for heavy construction when identical units are not sold and used for agricultural purposes.

Explanation of Test Report

General

Tractors are tested at the University of Nebraska according to the Agricultural Tractor Test Code approved by the American Society of Agricultural Engineers and the Society of Automotive Engineers or official Nebraska test procedure.

The manufacturer selects the tractor to be tested and certifies that it is a stock model. Each tractor is equipped with the common power consuming accessories such as power steering, power lift pump, generator, etc., if available. Power consuming accessories may be disconnected only when the means for disconnecting can be reached from the operating station. An official representative of the company is present during the test to see that the tractor gives its optimum performance. Additional weight may be added to the tractor as ballast if the manufacturer recommends use of such ballast. The static tire loads and the tire inflation pressures must conform to the specifications of Tire and Rim Association.

Preparation for Test

The engine crankcase is drained and refilled with new oil conforming to specifications in the operator's manual. The operator's manual is also used as the guide for selecting the proper fuel and for routine lubrication and maintenance operations.

The tractor is limbered up for a minimum of three hours on the drawbar. Preliminary adjustment of the tractor is permitted at this time. Any parts added or replaced during the limber-up run, or any subsequent runs, are mentioned in the individual test reports. The tractor is equipped with approximately the amount of added ballast that is to be used during the drawbar runs.

PTO Performance

Power take-off performance runs are made by connecting the power take-off to a dynamometer. During a preliminary power take-off run the manufacturer's representative may make adjustment for the fuel, ignition or injection timing and governor control settings. These settings must be maintained for the remainder of the test. The manually operated governor control mechanism is set to provide the high-idle speed specified by the manufacturer. During the power take-off runs an ambient air temperature of approximately 75°F. (24.0°C) is maintained.

Maximum power is obtained at the rated engine speed specified by the manufacturer with the governor control lever set for maximum power. This same setting is used for all subsequent PTO runs. Time of the run is two hours. Whenever the power take-off speed during the maximum power run differs from the speeds set forth in the ASAE and SAE standards, an additional run is made at either 540 or 1000 rpm of the power take-off shaft. Time of this run is one hour.

Drawbar Performance

Maximum drawbar power is shown for the normal field speed selected by the manufacturer. All engine adjustments are the same as those used in the power take-off runs. If the manufacturer specifies a different rated engine speed for drawbar operations, then the position of the manually operated governor control is changed to provide the high-idle speed specified.

Maximum drawbar power is determined within the following limits: (1) slip of the drivers must not exceed 15% for pneumatic tires on the concrete test course or 7% for steel cleats on the well packed earthen test course, (2) ground speeds must not exceed 10 miles per hour, (3) safe stability limits of the tractor must not be exceeded, (4) no other operating limit of the tractor must be exceeded. Drawbar load is applied until the manufacturer's rated engine speed is obtained with maximum governor control lever setting. Travel speed, drawbar pull and other data are recorded over two 500-foot straight level areas.

Fuel consumption is determined at the manufacturer's selected travel speed with the drawbar pull set: (1) to give rated engine rpm, (2) 75% of the pull at rated engine rpm, (3) 50% of the pull at rated engine rpm, and (4) maintaining the same load and travel speed as in (3) by shifting to a higher gear and reducing the engine rpm.

This summary shows the drawbar horsepower, corresponding travel speed and fuel consumption at 100%, 75% or 50% loads, and 50% of pull at reduced engine speed.

Also shown is the maximum drawbar horsepower produced for two 500-foot travel sections and corresponding travel speed, the maximum drawbar pull and the corresponding drive-wheel slippage.

In addition, the "lugging ability" obtained by increasing the load so that the full throttle engine speed drops to 80% of rated is given as a percent increase with respect to the pull at rated engine rpm.

The maximum drawbar horsepower and the corresponding speed and drawbar pull for other selected gears or travel speeds are shown in the individual test reports.

Sound Measurement

Sound is recorded during each of the Drawbar Performance runs as the tractor travels on a straight section of the test course. The dB(A) sound level is obtained with the microphone located near the right ear of the operator. Bystander sound readings are taken with the microphone placed 25 feet (7.5 m) from the line of travel of the tractor. An increase of 10dB(A) will approximately double the loudness to the human ear.

Individual copies of any test report, annual summary booklets or annual subscription (at $4.50) are available. For complete information write to **Department of Agricultural Engineering, Univ. of Nebraska—Lincoln, Lincoln, NE 68583.**

NEBRASKA TRACTOR TEST 1357 —
JOHN DEERE 4440 POWER SHIFT DIESEL
8 SPEED

POWER TAKE-OFF PERFORMANCE

	Power Hp *(kW)*	Crank shaft speed rpm	Fuel Consumption			Temperature °F *(°C)*			
			gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg *(kPa)*
MAXIMUM POWER AND FUEL CONSUMPTION									
Rated Engine Speed—Two Hours (PTO Speed—1010 rpm)									
	130.41 *(97.25)*	2200	8.508 *(32.206)*	0.461 *(0.280)*	15.32 *(3.020)*	191 *(88.5)*	65 *(18.3)*	76 *(24.3)*	29.013 *(97.974)*
VARYING POWER AND FUEL CONSUMPTION—Two Hours									
	114.04 *(85.04)*	2262	7.862 *(29.761)*	0.487 *(0.296)*	14.50 *(2.857)*	189 *(86.9)*	65 *(18.3)*	76 *(24.2)*	....
	0.00 *(0.00)*	2346	2.884 *(10.917)*	....	....	177 *(80.6)*	65 *(18.1)*	75 *(23.6)*	....
	58.13 *(43.35)*	2310	5.356 *(20.275)*	0.651 *(0.396)*	10.85 *(2.138)*	185 *(84.7)*	64 *(17.8)*	75 *(23.6)*	....
	130.53 *(97.34)*	2199	8.520 *(32.252)*	0.461 *(0.281)*	15.32 *(3.018)*	193 *(89.2)*	64 *(17.8)*	75 *(23.9)*	....
	29.26 *(21.82)*	2326	4.133 *(15.645)*	0.998 *(0.607)*	7.08 *(1.395)*	179 *(81.7)*	65 *(18.1)*	75 *(23.9)*	....
	86.50 *(64.50)*	2286	6.609 *(25.018)*	0.540 *(0.328)*	13.09 *(2.578)*	187 *(86.1)*	65 *(18.1)*	75 *(23.9)*	....
Av ***Av***	**69.74** ***(52.01)***	**2288**	**5.894** ***(22.311)***	**0.597** ***(0.363)***	**11.83** ***(2.331)***	**185** ***(84.9)***	**64** ***(18.0)***	**75** ***(23.8)***	**29.020** ***(97.996)***

DRAWBAR PERFORMANCE

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption			Temp °F *(°C)*			
					gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Cool-ing med	Air wet bulb	Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power—Two Hours 4th Gear											
111.23 *(82.95)*	9212 *(40.98)*	4.53 *(7.29)*	2200	6.69	8.460 *(32.023)*	0.537 *(0.327)*	13.15 *(2.590)*	194 *(90.0)*	73 *(22.8)*	85 *(29.2)*	28.945 *(97.743)*
75% of Pull at Maximum Power—Ten Hours 4th Gear											
90.52 *(67.50)*	7093 *(31.55)*	4.79 *(7.70)*	2285	5.13	7.408 *(28.044)*	0.578 *(0.352)*	12.22 *(2.407)*	186 *(85.7)*	61 *(16.3)*	64 *(17.9)*	29.041 *(98.067)*
50% of Pull at Maximum Power—Two Hours 4th Gear											
62.26 *(46.43)*	4733 *(21.05)*	4.93 *(7.94)*	2305	3.03	5.876 *(22.242)*	0.667 *(0.405)*	10.60 *(2.087)*	189 *(87.2)*	77 *(24.7)*	91 *(32.8)*	28.935 *(97.709)*
50% of Pull at Reduced Engine Speed—Two Hours 6th Gear											
62.14 *(46.34)*	4730 *(21.04)*	4.93 *(7.93)*	1364	2.95	4.389 *(16.614)*	0.499 *(0.303)*	14.16 *(2.789)*	187 *(86.1)*	73 *(22.8)*	81 *(26.9)*	28.930 *(97.692)*
MAXIMUM POWER IN SELECTED GEARS											
81.38 *(60.68)*	13738 *(61.11)*	2.22 *(3.58)*	2276	13.48	2nd Gear			184 *(84.2)*	67 *(19.4)*	70 *(21.1)*	28.950 *(97.760)*
109.86 *(81.92)*	12172 *(54.14)*	3.38 *(5.45)*	2199	10.08	3rd Gear			192 *(88.9)*	71 *(21.7)*	76 *(24.4)*	28.960 *(97.794)*
114.16 *(85.13)*	9449 *(42.03)*	4.53 *(7.29)*	2200	6.69	4th Gear			193 *(89.2)*	69 *(20.6)*	74 *(23.3)*	28.960 *(97.794)*
112.11 *(83.60)*	6948 *(30.90)*	6.05 *(9.74)*	2199	4.86	5th Gear			194 *(89.7)*	72 *(22.2)*	78 *(25.6)*	28.950 *(97.760)*
112.20 *(83.67)*	5320 *(23.67)*	7.91 *(12.73)*	2201	3.49	6th Gear			193 *(89.4)*	72 *(22.2)*	80 *(26.7)*	28.950 *(97.760)*

LUGGING ABILITY IN 4th GEAR

Crankshaft Speed rpm	2200	1982	1750	1545	1314	1093
Pull—lbs *(kN)*	9449 *(42.03)*	10755 *(47.84)*	11915 *(53.00)*	12706 *(56.52)*	12584 *(55.98)*	11242 *(50.01)*
Increase in Pull %	0	14	26	34	33	19
Power—Hp *(kW)*	114.16 *(85.13)*	115.53 *(86.15)*	111.16 *(82.89)*	102.88 *(76.72)*	86.77 *(64.70)*	65.94 *(49.17)*
Speed—Mph *(km/h)*	4.53 *(7.29)*	4.03 *(6.48)*	3.50 *(5.63)*	3.04 *(4.89)*	2.59 *(4.16)*	2.20 *(3.54)*
Slip %	6.69	7.89	9.54	10.87	10.87	8.86

Department of Agricultural Engineering

Dates of Test: August 18-29, 1980, Cab sound test No. 80-6, November 20, 1980

Manufacturer: JOHN DEERE WATERLOO TRACTOR WORKS, P.O. Box 270, Waterloo, Iowa 50704

FUEL, OIL AND TIME: **Fuel** No. 2 Diesel **Cetane No.** 47.9 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60°** *(15°/15°)* 0.8482 **Fuel weight** 7.063 lbs/gal *(0.846 kg/l)* **Oil SAE** 30 **API service classification** CD, CC and SD **To motor** 4.377 gal *(16.569 l)* **Drained from motor** 3.847 gal *(14.562 l)* **Transmission and final drive lubricant** John Deere Hy-Gard **Total time engine was operated** 37.0 hours

ENGINE: **Make** John Deere Diesel **Type** six cylinder vertical with turbocharger **Serial No.** 6466TR-04 139264RG **Crankshaft** lengthwise **Rated rpm** 2200 **Bore and stroke** 4.56″ × 4.75″ *(115.9 mm × 120.7 mm)* **Compression ratio** 15.8 to 1 **Displacement** 466 cu in *(7636 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements with dust evacuator **Oil filter** one paper cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for transmission and hydraulic oil **Fuel filter** two paper cartridges **Muffler** vertical **Cooling medium temperature control** two thermostats.

CHASSIS: **Type** standard with duals **Serial No.** 4440P-041136R **Tread width** rear 60″ *(1524 mm)* to 130″ *(3302 mm)* front 56″ *(1422 mm)* to 82″ *(2083 mm)* **Wheel base** 106.6″ *(2709 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 32.5″ *(826 mm)* Vertical distance above roadway 39.9″ *(1014 mm)* Horizontal distance from center of rear wheel tread 0.3″ *(7.5 mm)* to the left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with full range power shift **Advertised speeds mph *(km/h)*** first 1.8 *(2.7)* second 2.5 *(4.0)* third 3.8 *(6.1)* fourth 4.9 *(8.0)* fifth 6.4 *(10.5)* sixth 8.2 *(13.7)* seventh 11.0 *(17.5)* eighth 18.6 *(29.8)* reverse 2.2 *(3.6)*, 3.0 *(5.1)*, 4.6 *(7.6)*, 5.9 *(9.8)* **Clutch** wet multiple disc hydraulically power actuated and operated by foot pedal **Brakes** wet disc hydraulically power actuated and operated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 146″ *(3.71 m)* left 146″ *(3.71 m)* (on concrete surface without brake applied) right 163″ *(4.14 m)* left 163″ *(4.14 m)* **Turning space diameter** (on concrete surface with brake applied) right 302″ *(7.67 m)* left 302″ *(7.67 m)* (on concrete surface without brake) right 338″ *(8.58 m)* left 338″ *(8.58 m)* **Power take-off** 1010 rpm at 2200 engine rpm and 540 rpm at 2182 engine rpm.

TRACTOR SOUND LEVEL	With Cab dB(A)	W/O Cab dB(A)
Maximum Available Power—Two Hours	77.0	93.5
75% of Pull at Maximum Power—Ten Hours	77.0	93.0
50% of Pull at Maximum Power—Two Hours	77.5	93.0
50% of Pull at Reduced Engine Speed—Two Hours	74.5	89.0
Bystander in 8th gear	87.0	85.0

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi *(kPa)*	Four 18.4-38; 6; 12 *(85)*	Four 18.4-38; 6; 12 *(85)*
Ballast	—Liquid (each inner)	1328 lb *(602 kg)*	None
	—Cast Iron (each)	None	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 11.00-16; 8; 40 *(275)*	Two 11.00-16; 8; 40 *(275)*
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	None	None
Height of Drawbar		22.5 in *(570 mm)*	22.5 in *(570 mm)*
Static Weight with Operator	—Rear	12125 lb *(5500 kg)*	9470 lb *(4296 kg)*
	—Front	3650 lb *(1656 kg)*	3650 lb *(1656 kg)*
	—Total	15775 lb *(7156 kg)*	13120 lb *(5952 kg)*

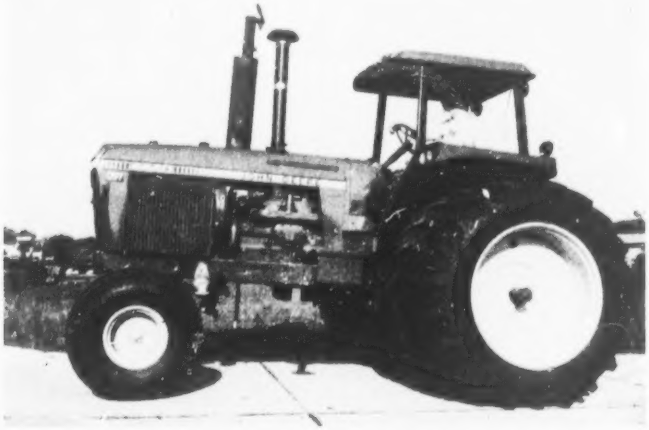
REPAIRS and ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump return was 150°F *(65.6°C)*. Five gears were chosen between stability limit and 10 mph *(16.1 km/h)*.

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1357.**

LOUIS I. LEVITICUS
Engineer-in-Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers



John Deere 4440 Power Shift Diesel

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Roy G. Arnold, Director

NEBRASKA TRACTOR TEST 1358 — JOHN DEERE 4640 POWER SHIFT DIESEL 8 SPEED

POWER TAKE-OFF PERFORMANCE

Power Hp *(kW)*	Crank shaft speed rpm	Fuel Consumption			Temperature °F *(°C)*			Barometer inch Hg *(kPa)*
		gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Cooling medium	Air wet bulb	Air dry bulb	
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—1015 rpm)								
155.96 *(116.30)*	2200	9.942 *(37.635)*	0.450 *(0.274)*	15.68 *(3.090)*	192 *(88.9)*	62 *(16.8)*	75 *(23.9)*	28.960 *(97.794)*
Standard Power Take-off Speed (1000 rpm)—One Hour								
157.01 *(117.08)*	2167	9.894 *(37.453)*	0.445 *(0.271)*	15.87 *(3.126)*	192 *(88.8)*	61 *(16.2)*	75 *(23.9)*	28.965 *(97.810)*
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
137.51 *(102.54)*	2281	9.336 *(35.341)*	0.480 *(0.292)*	14.73 *(2.901)*	189 *(87.2)*	62 *(16.4)*	75 *(23.9)*	....
0.00 *(0.00)*	2380	3.190 *(12.075)*	....	....	178 *(81.1)*	62 *(16.4)*	75 *(23.9)*	....
70.17 *(52.33)*	2331	6.261 *(23.700)*	0.630 *(0.383)*	11.21 *(2.208)*	185 *(85.0)*	62 *(16.7)*	75 *(23.9)*	....
157.16 *(117.19)*	2200	10.007 *(37.881)*	0.450 *(0.274)*	15.70 *(3.094)*	193 *(89.4)*	62 *(16.7)*	76 *(24.2)*	....
35.39 *(26.39)*	2351	4.821 *(18.249)*	0.962 *(0.585)*	7.34 *(1.446)*	179 *(81.7)*	62 *(16.7)*	75 *(23.9)*	....
104.32 *(77.79)*	2310	7.849 *(29.712)*	0.531 *(0.323)*	13.29 *(2.618)*	188 *(86.7)*	62 *(16.7)*	75 *(23.9)*	....
Av 84.09 ***Av (62.71)***	**2309**	**6.911** ***(26.161)***	**0.580** ***(0.353)***	**12.17** ***(2.397)***	**185** ***(85.2)***	**62** ***(16.6)***	**75** ***(23.9)***	**28.947** ***(97.749)***

DRAWBAR PERFORMANCE

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption			Temp. °F *(°C)*			Barom inch Hg *(kPa)*
					gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Cool-ing med	Air wet bulb	Air dry bulb	
Maximum Available Power—Two Hours 4th Gear											
132.44 *(98.76)*	10368 *(46.12)*	4.79 *(7.71)*	2198	7.55	9.787 *(37.047)*	0.522 *(0.317)*	13.53 *(2.666)*	196 *(90.8)*	66 *(18.6)*	80 *(26.4)*	29.075 *(98.182)*
75% of Pull at Maximum Power—Ten Hours 4th Gear											
109.02 *(81.30)*	8008 *(35.62)*	5.11 *(8.22)*	2290	5.36	8.690 *(32.894)*	0.563 *(0.342)*	12.55 *(2.472)*	194 *(89.8)*	68 *(20.2)*	85 *(29.6)*	28.997 *(97.919)*
50% of Pull at Maximum Power—Two Hours 4th Gear											
74.76 *(55.75)*	5334 *(23.73)*	5.26 *(8.46)*	2318	3.81	6.938 *(26.262)*	0.655 *(0.399)*	10.78 *(2.123)*	190 *(87.9)*	67 *(19.2)*	82 *(27.5)*	29.050 *(98.097)*
50% of Pull at Reduced Engine Speed—Two Hours 6th Gear											
74.47 *(55.53)*	5306 *(23.60)*	5.26 *(8.47)*	1353	3.69	5.221 *(19.763)*	0.495 *(0.301)*	14.26 *(2.810)*	191 *(88.3)*	66 *(18.6)*	84 *(28.9)*	29.035 *(98.047)*
MAXIMUM POWER IN SELECTED GEARS											
96.94 *(72.28)*	15989 *(71.12)*	2.27 *(3.66)*	2306	14.86		2nd Gear		187 *(86.1)*	65 *(18.3)*	76 *(24.4)*	28.870 *(97.490)*
131.38 *(97.97)*	13935 *(61.99)*	3.54 *(5.69)*	2201	11.36		3rd Gear		196 *(91.1)*	64 *(17.8)*	77 *(25.0)*	29.080 *(98.199)*
137.04 *(102.19)*	10694 *(47.57)*	4.81 *(7.73)*	2201	7.32		4th Gear		195 *(90.3)*	63 *(17.2)*	73 *(22.8)*	29.050 *(98.097)*
134.77 *(100.50)*	7798 *(34.69)*	6.48 *(10.43)*	2202	5.25		5th Gear		193 *(89.4)*	66 *(18.9)*	78 *(25.6)*	28.870 *(97.490)*
134.62 *(100.39)*	5924 *(26.35)*	8.52 *(13.71)*	2198	3.97		6th Gear		194 *(90.0)*	67 *(19.4)*	80 *(26.7)*	28.870 *(97.490)*

LUGGING ABILITY IN 4th GEAR

Crankshaft Speed rpm	2201	1966	1754	1546	1320	1090
Pull—lbs *(kN)*	10694 *(47.57)*	12063 *(53.66)*	12991 *(57.79)*	13747 *(61.15)*	13795 *(61.36)*	11799 *(52.48)*
Increase in Pull %	0	13	21	29	29	10
Power—Hp *(kW)*	137.04 *(102.19)*	136.35 *(101.68)*	129.54 *(96.60)*	119.45 *(89.07)*	102.11 *(76.15)*	73.91 *(55.12)*
Speed—Mph *(km/h)*	4.81 *(7.73)*	4.24 *(6.82)*	3.74 *(6.02)*	3.26 *(5.24)*	2.78 *(4.47)*	2.35 *(3.78)*
Slip %	7.32	8.59	9.46	10.59	10.73	8.44

Department of Agricultural Engineering

Dates of Test: August 18-28, 1980, Cab sound test No. 80-4 November 19, 1980

Manufacturer: JOHN DEERE WATERLOO TRACTOR WORKS, P.O. Box 270, Waterloo, Iowa 50704

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 47.9 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60°** ***(15°/15°)*** 0.8482 **Fuel weight** 7.063 lbs/gal *(0.846 kg/l)* **Oil SAE** 30 **API service classification** CD, CC and SD **To motor** 5.662 gal *(21.431 l)* **Drained from motor** 5.484 gal *(20.757 l)* **Transmission and final drive lubricant** John Deere Hy-Gard **Total time engine was operated** 36.0 hours

ENGINE: Make John Deere Diesel **Type** six cylinder vertical with turbocharger and intercooler **Serial No.** 6466AR-08 139316RG **Crankshaft** lengthwise **Rated rpm** 2200 **Bore and stroke** 4.56" × 4.75" *(115.8 mm × 120.7 mm)* **Compression ratio** 15.0 to 1 **Displacement** 466 cu in *(7636 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements **Oil filter** one paper cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for transmission and hydraulic oil **Fuel filter** two snap-on paper cartridges **Muffler** vertical **Cooling medium temperature control** two thermostats.

CHASSIS: Type standard with duals **Serial No.** 4640P-18823R **Tread width** rear 60" *(1524 mm)* to 131.6" *(3342 mm)* front 60.8" *(1543 mm)* to 84.9" *(2156 mm)* **Wheel base** 118.5" *(3009 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 33.0" *(838 mm)* Vertical distance above roadway 43.5" *(1106 mm)* Horizontal distance from center of rear wheel tread 0.2" *(6 mm)* to the left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with full range power shift **Advertised speeds mph** ***(km/h)*** first 1.8 *(2.9)* second 2.6 *(4.1)* third 4.0 *(6.4)* fourth 5.2 *(8.4)* fifth 6.8 *(11.0)* sixth 8.9 *(14.3)* seventh 11.4 *(18.3)* eighth 19.5 *(31.3)* reverse 2.3 *(3.7)*, 3.3 *(5.3)*, 5.1 *(8.2)*, 6.7 *(10.7)* **Clutch** wet multiple disc hydraulically power actuated and operated by foot pedal **Brakes** wet disc hydraulically power actuated and operated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 161" *(4.09 m)* left 161" *(4.09 m)* (on concrete surface without brake applied) right 182" *(4.62 m)* left 182" *(4.62 m)* **Turning space diameter** (on concrete surface with brake applied) right 336" *(8.53 m)* left 336" *(8.53 m)* (on concrete surface without brake) right 377" *(9.58 m)* left 377" *(9.58 m)* **Power take-off** 1000 rpm at 2167 engine rpm

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

TRACTOR SOUND LEVEL	With Cab dB(A)	W/O Cab dB(A)
Maximum Available Power—Two Hours	77.0	94.5
75% of Pull at Maximum Power—Ten Hours	78.0	95.0
50% of Pull at Maximum Power—Two Hours	77.5	96.0
50% of Pull at Reduced Engine Speed—Two Hours	75.5	90.0
Bystander in 8th gear	87.5	86.5

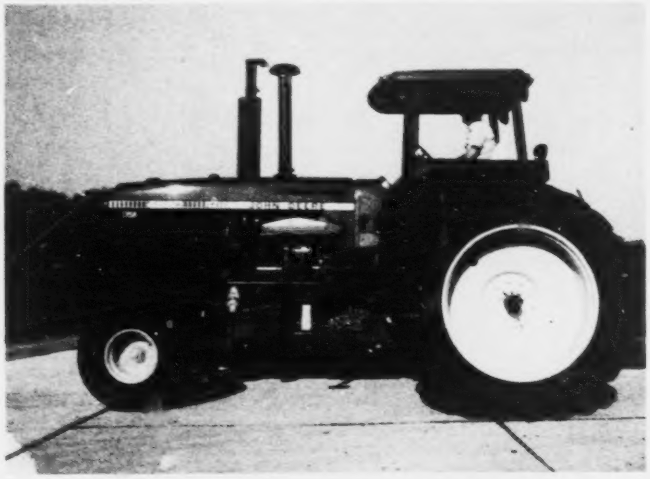
TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi *(kPa)*	Four 18.4-42; 10; 14 *(95)*	Four 18.4-42; 10; 14 *(95)*
Ballast	—Liquid (each inner)	None	None
	—Cast Iron (each)	686 lb *(311 kg)*	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 14L-16.1; 10; 44 *(305)*	Two 14L-16.1; 10; 44 *(305)*
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	30 lb *(14 kg)*	None
Height of Drawbar		24 in *(610 mm)*	24 in *(610 mm)*
Static Weight with Operator	—Rear	14175 lb *(6430 kg)*	11430 lb *(5185 kg)*
	—Front	4410 lb *(2000 kg)*	4350 lb *(1973 kg)*
	—Total	18585 lb *(8430 kg)*	15780 lb *(7158 kg)*

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump return was 154°F *(67.8°C)*. Five gears were chosen between 15% slip and 10 mph *(16.1 km/h)*.

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1358.**

LOUIS I. LEVITICUS
Engineer-in-Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers



John Deere 4640 Power Shift Diesel

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska-Lincoln
Roy G. Arnold, Director

NEBRASKA TRACTOR TEST 1359 —
JOHN DEERE 4040 SYNCRO RANGE DIESEL
8 SPEED

POWER TAKE-OFF PERFORMANCE

Power Hp *(kW)*	Crank shaft speed rpm	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temperature °F (°C) Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg *(kPa)*
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—1002 rpm)								
90.31 *(67.34)*	2200	6.512 *(24.652)*	0.503 *(0.306)*	13.87 *(2.732)*	193 *(89.6)*	70 *(21.0)*	75 *(23.8)*	28.937 *(97.715)*
VARYING POWER AND FUEL CONSIMPTION—Two Hours								
79.12 *(59.00)*	2266	5.814 *(22.006)*	0.513 *(0.312)*	13.61 *(2.681)*	190 *(87.8)*	69 *(20.6)*	75 *(23.9)*	....
0.00 *(0.00)*	2356	2.419 *(9.157)*	....	....	181 *(82.8)*	69 *(20.3)*	74 *(23.1)*	....
40.56 *(30.25)*	2323	4.000 *(15.142)*	0.689 *(0.419)*	10.14 *(1.998)*	187 *(85.8)*	69 *(20.6)*	74 *(23.3)*	....
90.66 *(67.61)*	2200	6.527 *(24.706)*	0.503 *(0.306)*	13.89 *(2.736)*	194 *(90.0)*	69 *(20.6)*	75 *(23.9)*	....
20.32 *(15.15)*	2342	3.201 *(12.117)*	1.100 *(0.669)*	6.35 *(1.250)*	182 *(83.3)*	70 *(20.8)*	76 *(24.2)*	....
59.96 *(44.71)*	2294	4.825 *(18.265)*	0.562 *(0.342)*	12.43 *(2.448)*	189 *(87.2)*	70 *(21.1)*	75 *(23.9)*	....
Av 48.44 ***Av (36.12)***	**2297**	**4.464** ***(16.899)***	**0.644** ***(0.391)***	**10.85** ***(2.137)***	**187** ***(86.2)***	**69** ***(20.7)***	**75** ***(23.7)***	**28.947** ***(97.749)***

DRAWBAR PERFORMANCE

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temp. °F (°C) Cool-ing med	Air wet bulb	Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power—Two Hours 4th Gear											
73.83 *(55.05)*	5716 *(25.43)*	4.84 *(7.80)*	2199	7.31	6.320 *(23.923)*	0.598 *(0.364)*	11.68 *(2.301)*	200 *(93.3)*	73 *(22.8)*	87 *(30.3)*	29.025 *(98.013)*
75% of Pull at Maximum Power—Ten Hours 4th Gear											
60.45 *(45.08)*	4437 *(19.74)*	5.11 *(8.22)*	2266	5.16	5.357 *(20.277)*	0.619 *(0.376)*	11.29 *(2.223)*	193 *(89.6)*	74 *(23.5)*	89 *(31.4)*	28.934 *(97.706)*
50% of Pull at Maximum Power—Two Hours 4th Gear											
42.02 *(31.34)*	2974 *(13.23)*	5.30 *(8.53)*	2307	3.38	4.333 *(16.401)*	0.720 *(0.438)*	9.70 *(1.911)*	191 *(88.3)*	75 *(23.9)*	95 *(35.0)*	29.000 *(97.929)*
50% of Pull at Reduced Engine Speed—Two Hours 6th Gear											
41.87 *(31.23)*	2962 *(13.18)*	5.30 *(8.53)*	1418	3.20	3.187 *(12.063)*	0.531 *(0.323)*	13.14 *(2.589)*	195 *(90.3)*	74 *(23.3)*	97 *(36.1)*	28.965 *(97.810)*
MAXIMUM POWER IN SELECTED GEARS											
64.76 *(48.29)*	9035 *(40.19)*	2.69 *(4.33)*	2262	14.80		2nd Gear		190 *(87.5)*	67 *(19.4)*	71 *(21.7)*	28.990 *(97.895)*
74.02 *(55.20)*	7616 *(33.88)*	3.64 *(5.87)*	2199	10.46		3rd Gear		195 *(90.3)*	70 *(21.1)*	78 *(25.6)*	29.010 *(97.962)*
76.42 *(56.99)*	5916 *(26.32)*	4.84 *(7.80)*	2200	7.38		4th Gear		193 *(89.2)*	68 *(20.0)*	75 *(23.9)*	29.010 *(97.962)*
76.85 *(57.39)*	4691 *(20.87)*	6.14 *(9.89)*	2200	5.79		5th Gear		194 *(90.0)*	71 *(21.7)*	80 *(26.7)*	29.020 *(97.996)*
77.04 *(57.45)*	3548 *(15.78)*	8.14 *(13.11)*	2200	4.23		6th Gear		194 *(90.0)*	72 *(22.2)*	82 *(27.8)*	29.030 *(98.030)*

LUGGING ABILITY IN 4th GEAR

Crankshaft Speed rpm	2200	1983	1756	1537	1316	1093
Pull—lbs *(kN)*	5916 *(26.32)*	6391 *(28.43)*	6558 *(29.17)*	6783 *(30.17)*	6864 *(30.53)*	6697 *(29.79)*
Increase in Pull %	0	8	11	15	16	13
Power—Hp *(kW)*	76.42 *(56.99)*	73.86 *(55.08)*	66.94 *(49.92)*	60.35 *(45.00)*	52.18 *(38.91)*	42.40 *(31.61)*
Speed—Mph *(km/h)*	4.84 *(7.80)*	4.33 *(6.97)*	3.83 *(6.16)*	3.34 *(5.37)*	2.85 *(4.59)*	2.37 *(3.82)*
Slip %	7.38	8.12	8.38	8.78	8.91	8.78

Department of Agricultural Engineering

Dates of Test: August 20 to September 9, 1980

Manufacturer: JOHN DEERE WATERLOO TRACTOR WORKS, P.O. Box 270, Waterloo, Iowa 50704

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 47.9 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60°** *(15°/15°)* 0.8386 **Fuel weight** 6.982 lbs/gal *(0.837 kg/l)* **Oil SAE** 30 **API service classification** CD, CC and SD **To motor** 3.862 gal *(14.618 l)* **Drained from motor** 3.694 gal *(13.982 l)* **Transmission and final drive lubricant** John Deere Hy-Gard **Total time engine was operated** 31.5 hours

ENGINE: Make John Deere Diesel **Type** six cylinder vertical **Serial No.** 6404DR-25 582939RG **Crankshaft** lengthwise **Rated rpm** 2200 **Bore and stroke** 4.25" × 4.75" *(108 mm × 120.6 mm)* **Compression ratio** 16.6 to 1 **Displacement** 404 cu in *(6620 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements with dust evacuator **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for transmission and hydraulic oil **Fuel filter** one paper element **Muffler** vertical **Cooling medium temperature control** two thermostats.

CHASSIS: Type standard **Serial No.** 4040W-008515R **Tread width** rear 60" *(1524 mm)* to 90" *(2286 mm)* front 56" *(1422 mm)* to 82" *(2083 mm)* **Wheel base** 104" *(2641 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 31.3" *(795 mm)* Vertical distance above roadway 38.2" *(971 mm)* Horizontal distance from center of rear wheel tread 0.1" *(2.0 mm)* to the left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph *(km/h)*** first 1.9 *(3.1)* second 3.0 *(4.8)* third 4.0 *(6.4)* fourth 5.1 *(8.2)* fifth 6.3 *(10.2)* sixth 8.3 *(13.4)* seventh 10.7 *(17.3)* eighth 17.5 *(28.2)* reverse 3.8 *(6.3)*, 6.2 *(10.0)* **Clutch** wet multiple disc hydraulically power actuated and operated by foot pedal **Brakes** wet disc hydraulically power actuated and operated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 143" *(3.63 m)* left 143" *(3.63 m)* (on concrete surface without brake) right 158.5" *(4.03 m)* left 158.5" *(4.03 m)* **Turning space diameter** (on concrete surface with brake applied) right 295.8" *(7.51 m)* left 295.8" *(7.51 m)* (on concrete surface without brake) right 326.9" *(8.30 m)* left 326.9" *(8.30 m)* **Power take-off** 1002 rpm at 2200 engine rpm and 540 rpm at 2200 engine rpm.

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)
Maximum Available Power—Two Hours	95.5
75% of Pull at Maximum Power—Ten Hours	96.5
50% of Pull at Maximum Power—Two Hours	94.0
50% of Pull at Reduced Engine Speed—Two Hours	90.0
Bystander in 8th gear	89.0

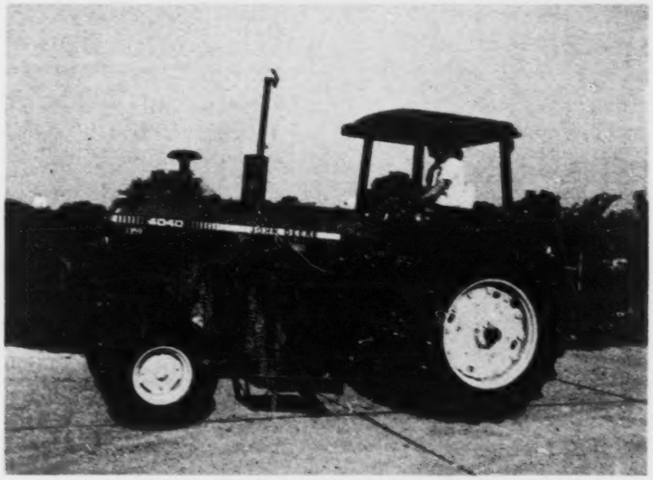
TIRES, BALLAST AND WEIGHT		**With Ballast**	**Without Ballast**
Rear Tires	—No., size, ply & psi *(kPa)*	Two 18.4-34; 8; 20 *(140)*	Two 18.4-34; 8; 20 *(140)*
Ballast	—Liquid (each)	770 lb *(349 kg)*	None
	—Cast Iron (each)	None	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 10.00-16; 6; 32 *(220)*	Two 10.00-16; 6; 32 *(220)*
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	30 lb *(14 kg)*	None
Height of Drawbar		18.5 in *(470 mm)*	18.5 in *(470 mm)*
Static Weight with Operator	—Rear	8930 lb *(4051 kg)*	7390 lb *(3352 kg)*
	Front	3160 lb *(1433 kg)*	3100 lb *(1406 kg)*
	Total	12090 lb *(5484 kg)*	10490 lb *(4758 kg)*

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump return was 152°F *(66.7°C)*. Five gears were chosen between 15% slip and 10 mph *(16.1 km/h)*.

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1359**.

LOUIS I. LEVITICUS
Engineer-in Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers



John Deere 4040 Syncro Range Diesel

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Roy G. Arnold, Director

NEBRASKA TRACTOR TEST 1360 — JOHN DEERE 4040 POWER SHIFT DIESEL 8 SPEED

POWER TAKE-OFF PERFORMANCE

	Power Hp *(kW)*	Crank shaft speed rpm	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temperature °F *(°C)* Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg *(kPa)*
MAXIMUM POWER AND FUEL CONSUMPTION									
Rated Engine Speed—Two Hours (PTO Speed—1011 rpm)									
	90.79 *(67.70)*	2200	6.745 *(25.533)*	0.519 *(0.316)*	13.46 *(2.651)*	194 *(90.1)*	68 *(20.1)*	75 *(23.9)*	29.020 *(97.996)*
Standard Power Take-off Speed (1000 rpm)—One Hour									
	90.88 *(67.77)*	2177	6.712 *(25.406)*	0.516 *(0.314)*	13.54 *(2.667)*	194 *(90.1)*	68 *(20.0)*	75 *(23.9)*	29.035 *(98.047)*
VARYING POWER AND FUEL CONSUMPTION—Two Hours									
	79.56 *(59.33)*	2268	5.908 *(22.364)*	0.519 *(0.315)*	13.47 *(2.653)*	190 *(87.5)*	68 *(19.7)*	75 *(23.6)*	....
	0.00 *(0.00)*	2349	2.368 *(8.962)*	....	....	177 *(80.6)*	68 *(20.0)*	75 *(23.6)*	....
	40.55 *(30.24)*	2320	3.983 *(15.077)*	0.686 *(0.417)*	10.18 *(2.006)*	186 *(85.3)*	68 *(19.7)*	75 *(23.9)*	....
	91.11 *(67.94)*	2200	6.759 *(25.585)*	0.518 *(0.315)*	13.48 *(2.655)*	195 *(90.3)*	68 *(19.7)*	75 *(23.9)*	....
	20.42 *(15.23)*	2334	3.167 *(11.987)*	1.083 *(0.659)*	6.45 *(1.271)*	179 *(81.7)*	68 *(19.7)*	76 *(24.2)*	....
	60.20 *(44.89)*	2294	4.855 *(18.379)*	0.563 *(0.343)*	12.40 *(2.442)*	189 *(86.9)*	68 *(19.7)*	75 *(23.9)*	....
Av ***Av***	**48.64** ***(36.27)***	**2294**	**4.507** ***(17.059)***	**0.647** ***(0.394)***	**10.79** ***(2.126)***	**186** ***(85.4)***	**68** ***(19.8)***	**75** ***(23.8)***	**29.037** ***(98.052)***

DRAWBAR PERFORMANCE

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temp. °F *(°C)* Cool-ing med	Air wet bulb	Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power—Two Hours 4th Gear											
76.56 *(57.09)*	6464 *(28.75)*	4.44 *(7.15)*	2200	8.59	6.660 *(25.211)*	0.607 *(0.369)*	11.50 *(2.265)*	192 *(88.6)*	53 *(11.7)*	63 *(16.9)*	29.265 *(98.824)*
75% of Pull at Maximum Power—Ten Hours 4th Gear											
62.81 *(46.84)*	4959 *(22.06)*	4.75 *(7.64)*	2289	6.07	5.536 *(20.955)*	0.615 *(0.374)*	11.35 *(2.235)*	191 *(88.2)*	57 *(13.7)*	68 *(20.2)*	29.189 *(98.567)*
50% of Pull at Maximum Power—Two Hours 4th Gear											
43.07 *(32.12)*	3309 *(14.72)*	4.88 *(7.86)*	2308	4.25	4.512 *(17.078)*	0.731 *(0.445)*	9.55 *(1.881)*	187 *(85.8)*	54 *(12.2)*	64 *(17.8)*	29.265 *(98.824)*
50% of Pull at Reduced Engine Speed—Two Hours 6th Gear											
43.12 *(32.15)*	3307 *(14.71)*	4.89 *(7.87)*	1368	4.14	3.402 *(12.876)*	0.551 *(0.335)*	12.68 *(2.497)*	189 *(86.9)*	57 *(13.9)*	68 *(19.7)*	29.240 *(98.739)*
MAXIMUM POWER IN SELECTED GEARS											
52.67 *(39.28)*	9195 *(40.90)*	2.15 *(3.46)*	2297	14.76		2nd Gear		184 *(84.2)*	56 *(13.3)*	61 *(16.1)*	29.230 *(98.705)*
74.52 *(55.57)*	8576 *(38.15)*	3.26 *(5.24)*	2202	13.24		3rd Gear		191 *(88.3)*	56 *(13.2)*	61 *(16.1)*	29.260 *(98.807)*
78.54 *(58.57)*	6620 *(29.45)*	4.45 *(7.16)*	2200	8.39		4th Gear		192 *(88.6)*	55 *(12.8)*	60 *(15.6)*	29.240 *(98.739)*
75.84 *(56.55)*	4770 *(21.22)*	5.96 *(9.59)*	2200	6.00		5th Gear		191 *(88.3)*	56 *(13.3)*	61 *(16.1)*	29.260 *(98.807)*
75.93 *(56.62)*	3633 *(16.16)*	7.84 *(12.61)*	2201	4.36		6th Gear		191 *(88.3)*	56 *(13.3)*	62 *(16.7)*	29.270 *(98.840)*

LUGGING ABILITY IN 4th GEAR

Crankshaft Speed rpm	2200	1981	1758	1546	1314	1092	871
Pull—lbs *(kN)*	6620 *(29.45)*	7177 *(31.66)*	7354 *(32.71)*	7580 *(33.72)*	7625 *(33.92)*	7832 *(34.84)*	7774 *(34.58)*
Increase in Pull %	0	8	11	15	15	18	17
Power—Hp *(kW)*	78.54 *(58.57)*	75.42 *(56.24)*	68.70 *(51.23)*	62.04 *(46.26)*	52.92 *(39.46)*	44.96 *(33.52)*	35.60 *(26.55)*
Speed—Mph *(km/h)*	4.45 *(7.16)*	3.97 *(6.40)*	3.50 *(5.64)*	3.07 *(4.94)*	2.60 *(4.19)*	2.15 *(3.46)*	1.72 *(2.76)*
Slip %	8.39	9.11	9.76	10.15	10.28	10.66	10.66

Department of Agricultural Engineering

Dates of Test: August 20 to September 11, 1980, Cab sound test No. 80-3 November 19, 1980

Manufacturer: JOHN DEERE WATERLOO TRACTOR WORKS, P.O. Box 270, Waterloo, Iowa 50704

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 47.9 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60°** *(15°/15°)* **Fuel weight** 6.982 lbs/gal *(0.837 kg/l)* **Oil SAE** 30 **API service classification** CD, CC and SD **To motor** 4.396 gal *(16.639 l)* **Drained from motor** 3.973 gal *(15.039 l)* **Transmission and final drive lubricant** John Deere Hy-Gard **Total time engine was operated** 36.5 hours

ENGINE: Make John Deere Diesel **Type** six cylinder vertical **Serial No.** 6404DR-26 582887RG **Crankshaft** lengthwise **Rated rpm** 2200 **Bore and stroke** 4.25" × 4.75" *(108 mm × 120.7 mm)* **Compression ratio** 16.6 to 1 **Displacement** 404 cu in *(6620 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements with dust evacuator **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for transmission and hydraulic oil **Fuel filter** one paper cartridge **Muffler** vertical **Cooling medium temperature control** two thermostats.

CHASSIS: Type standard **Serial No.** 4040P-008517R **Tread width** rear 60" *(1524 mm)* to 90.0" *(2286 mm)* front 56" *(1422 mm)* to 82" *(2083 mm)* **Wheel base** 104" *(2642 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 31.3" *(794 mm)* Vertical distance above roadway 38.2" *(971 mm)* Horizontal distance from center of rear wheel tread 0.1" *(2.0 mm)* to the left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with full range power shift **Advertised speeds mph *(km/h)*** first 1.7 *(2.7)* second 2.4 *(3.9)* third 3.7 *(6.0)* fourth 4.7 *(7.6)* fifth 6.1 *(9.8)* sixth 7.9 *(12.7)* seventh 10.5 *(16.9)* eighth 17.5 *(28.2)* reverse 1.9 *(3.1)*, 2.8 *(4.5)*, 4.3 *(6.9)*, 5.5 *(8.9)* **Clutch** wet multiple disc hydraulically power actuated and operated by foot pedal **Brakes** wet disc hydraulically power actuated and operated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 143" *(3.63 m)* left 143" *(3.63 m)* (on concrete surface without brake) right 158.5" *(4.03 m)* left 158.5" *(4.03 m)* **Turning space diameter** (on concrete surface with brake applied) right 295.8" *(7.51 m)* left 295.8" *(7.51 m)* (on concrete surface without brake) right 326.9" *(8.30 m)* left 326.9" *(8.30 m)* **Power take-off** 1000 rpm at 2177 engine rpm and 540 rpm at 2182 engine rpm.

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

TRACTOR SOUND LEVEL	With Cab dB(A)	W/O Cab dB(A)
Maximum Available Power—Two Hours	78.0	95.5
75% of Pull at Maximum Power—Ten Hours	77.5	95.5
50% of Pull at Maximum Power—Two Hours	77.0	95.5
50% of Pull at Reduced Engine Speed—Two Hours	75.5	90.0
Bystander in 8th gear	90.5	90.5

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi *(kPa)*	Two 18.4-34; 8; 20 *(140)*	Two 18.4-34; 8; 20 *(140)*
Ballast	—Liquid (each)	750 lb *(340 kg)*	None
	—Cast Iron (each)	None	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 10.00-16, 6; 32 *(220)*	Two 10.00-16; 6; 32 *(220)*
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	45 lb *(20 kg)*	None
Height of Drawbar		18.5 in *(470 mm)*	18.5 in *(470 mm)*
Static Weight with Operator	—Rear	8930 lb *(4050 kg)*	7430 lb *(3370 kg)*
	—Front	3150 lb *(1429 kg)*	3060 lb *(1388 kg)*
	—Total	12080 lb *(5479 kg)*	10490 lb *(4758 kg)*

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump return was 154°F *(67.6°C)*. Five gears were chosen between 15% slip and 10 mph *(16.1 km/h)*.

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1360.**

LOUIS I. LEVITICUS
Engineer-in-Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

4040
1360
JOHN DEERE

John Deere 4040 Power Shift Diesel

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Roy G. Arnold, Director

NEBRASKA TRACTOR TEST 1361 —
JOHN DEERE 4240 SYNCRO RANGE DIESEL
8 SPEED

POWER TAKE-OFF PERFORMANCE

	Power Hp *(kW)*	Crank shaft speed rpm	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temperature °F *(°C)* Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg *(kPa)*
MAXIMUM POWER AND FUEL CONSUMPTION									
Rated Engine Speed—Two Hours (PTO Speed—1002 rpm)									
	110.81 *(82.63)*	2200	7.822 *(29.608)*	0.493 *(0.300)*	14.17 *(2.791)*	192 *(88.8)*	67 *(19.4)*	75 *(23.9)*	29.060 *(98.131)*
VARYING POWER AND FUEL CONSUMPTION—Two Hours									
	98.09 *(73.15)*	2290	7.167 *(27.130)*	0.510 *(0.310)*	13.69 *(2.696)*	187 *(86.1)*	67 *(19.4)*	75 *(23.9)*	....
	0.00 *(0.00)*	2368	2.853 *(10.800)*	....	....	177 *(80.6)*	67 *(19.4)*	75 *(23.6)*	....
	49.95 *(37.25)*	2339	4.825 *(18.266)*	0.675 *(0.410)*	10.35 *(2.039)*	183 *(83.9)*	67 *(19.4)*	75 *(23.6)*	....
	111.65 *(83.26)*	2200	7.867 *(29.781)*	0.492 *(0.299)*	14.19 *(2.796)*	192 *(88.6)*	68 *(19.7)*	75 *(23.6)*	....
	25.28 *(18.85)*	2354	3.811 *(14.427)*	1.053 *(0.640)*	6.63 *(1.307)*	178 *(81.1)*	68 *(20.0)*	75 *(23.9)*	....
	74.42 *(55.49)*	2319	5.917 *(22.397)*	0.555 *(0.338)*	12.58 *(2.478)*	185 *(85.0)*	68 *(20.0)*	75 *(23.9)*	....
Av ***Av***	**59.90** ***(44.67)***	**2312**	**5.407** ***(20.467)***	**0.630** ***(0.383)***	**11.08** ***(2.183)***	**184** ***(84.2)***	**67** ***(19.7)***	**75** ***(23.8)***	**29.047** ***(98.086)***

DRAWBAR PERFORMANCE

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temp °F *(°C)* Cooling med	Air wet bulb	Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power—Two Hours 4th Gear											
93.00 *(69.35)*	7118 *(31.66)*	4.90 *(7.89)*	2201	5.97	7.752 *(29.345)*	0.582 *(0.354)*	12.00 *(2.363)*	192 *(88.6)*	73 *(22.5)*	79 *(26.1)*	29.070 *(98.165)*
75% of Pull at Maximum Power—Ten Hours 4th Gear											
75.33 *(56.17)*	5401 *(24.03)*	5.23 *(8.42)*	2306	4.22	6.567 *(24.858)*	0.609 *(0.370)*	11.47 *(2.259)*	186 *(85.6)*	60 *(15.7)*	76 *(24.7)*	29.066 *(98.152)*
50% of Pull at Maximum Power—Two Hours 4th Gear											
51.82 *(38.65)*	3611 *(16.06)*	5.38 *(8.66)*	2335	2.69	5.281 *(19.992)*	0.712 *(0.433)*	9.81 *(1.933)*	189 *(86.9)*	75 *(23.9)*	91 *(32.8)*	28.760 *(97.118)*
50% of Pull at Reduced Engine Speed—Two Hours 6th Gear											
51.87 *(38.68)*	3614 *(16.08)*	5.38 *(8.66)*	1436	2.73	3.778 *(14.300)*	0.508 *(0.309)*	13.73 *(2.705)*	189 *(87.2)*	76 *(24.2)*	93 *(33.9)*	28.725 *(97.000)*
MAXIMUM POWER IN SELECTED GEARS											
86.57 *(64.56)*	12240 *(54.45)*	2.65 *(4.27)*	2240	14.78		2nd Gear		186 *(85.3)*	61 *(16.1)*	65 *(18.3)*	29.050 *(98.097)*
93.19 *(69.49)*	9393 *(41.78)*	3.72 *(5.99)*	2198	8.25		3rd Gear		190 *(87.5)*	69 *(20.6)*	74 *(23.3)*	29.060 *(98.131)*
95.40 *(71.14)*	7305 *(32.50)*	4.90 *(7.88)*	2200	6.01		4th Gear		189 *(87.2)*	62 *(16.7)*	66 *(18.9)*	29.060 *(98.131)*
94.28 *(70.31)*	5696 *(25.34)*	6.21 *(9.99)*	2290	4.45		5th Gear		194 *(89.7)*	70 *(21.1)*	79 *(26.1)*	28.820 *(97.321)*
93.21 *(69.51)*	4266 *(18.98)*	8.19 *(13.19)*	2201	3.29		6th Gear		194 *(90.0)*	71 *(21.7)*	81 *(27.2)*	28.820 *(97.321)*

LUGGING ABILITY IN 4th GEAR

Crankshaft Speed rpm	2200	1981	1760	1542	1317	1092	871
Pull—lbs *(kN)*	7305 *(32.50)*	7936 *(35.30)*	8411 *(37.42)*	8640 *(38.43)*	8731 *(38.84)*	8752 *(38.93)*	8715 *(38.76)*
Increase in Pull %	0	9	15	18	20	20	19
Power—Hp *(kW)*	95.40 *(71.14)*	92.77 *(69.18)*	86.88 *(64.79)*	77.94 *(58.12)*	67.15 *(50.07)*	55.81 *(41.62)*	44.41 *(33.12)*
Speed—Mph *(km/h)*	4.90 *(7.88)*	4.38 *(7.05)*	3.87 *(6.23)*	3.38 *(5.44)*	2.88 *(4.64)*	2.39 *(3.85)*	1.91 *(3.08)*
Slip %	6.01	6.63	7.04	7.31	7.58	7.58	7.72

Department of Agricultural Engineering

Dates of Test: August 20 to September 6, 1980

Manufacturer: JOHN DEERE WATERLOO TRACTOR WORKS, P.O. Box 270, Waterloo, Iowa 50704

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 47.9 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60° *(15°/15°)*** 0.8386 **Fuel weight** 6.982 lbs/gal *(0.837 kg/l)* **Oil SAE** 30 **API service classification** CD, CC and SD **To motor** 4.171 gal *(15.787 l)* **Drained from motor** 3.861 gal *(14.614 l)* **Transmission and final drive lubricant** John Deere Hy-Gard **Total time engine was operated** 36.0 hours

ENGINE Make John Deere Diesel **Type** six cylinder vertical **Serial No.** 6466DR-01 137422RG **Crankshaft** lengthwise **Rated rpm** 2200 **Bore and stroke** 4.56" × 4.75" *(115.8 mm × 120.6 mm)* **Compression ratio** 17.0 to 1 **Displacement** 466 cu in *(7636 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements with dust evacuator **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for transmission and hydraulic oil **Muffler** vertical **Cooling medium temperature control** two thermostats.

CHASSIS: Type standard with duals **Serial No.** 4240W-019552R **Tread width** rear 60" *(1524 mm)* to 118.4" *(3004 mm)* front 56" *(1422 mm)* to 82" *(2083 mm)* **Wheel base** 106.7" *(2709 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 30.1" *(765 mm)* Vertical distance above roadway 40.1" *(1019 mm)* Horizontal distance from center of rear wheel tread 0.1" *(1.0 mm)* to the left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph *(km/h)*** first 1.9 *(3.1)* second 3.1 *(4.9)* third 4.1 *(6.6)* fourth 5.2 *(8.4)* fifth 6.5 *(10.5)* sixth 8.5 *(13.7)* seventh 11.1 *(17.9)* eighth 18.1 *(29.1)* reverse 4.0 *(6.4)*, 6.3 *(10.2)* **Clutch** wet multiple disc hydraulically power actuated and operated by foot pedal **Brakes** wet disc hydraulically power actuated and operated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 143.9" *(3.66 m)* left 143.9" *(3.66 m)* (on concrete surface without brake) right 161.8" *(4.11 m)* left 161.8" *(4.11 m)* **Turning space diameter** (on concrete surface with brake applied) right 293.3" *(7.45 m)* left 293.3" *(7.45 m)* (on concrete surface without brake) right 334.6" *(8.50 m)* left 334.6" *(8.50 m)* **Power take-off** 1002 rpm at 2200 engine rpm and 540 rpm at 2200 engine rpm.

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)
Maximum Available Power—Two Hours	96.0
75% of Pull at Maximum Power—Ten Hours	96.0
50% of Pull at Maximum Power—Two Hours	96.5
50% of Pull at Reduced Engine Speed—Two Hours	91.0
Bystander in 8th gear	90.5

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi *(kPa)*	Four 18.4-34; 6; 12 *(85)*	Four 18.4-34; 6; 12 *(85)*
Ballast	—Liquid (each inner)	995 lb *(451 kg)*	None
	—Cast Iron (each)	110 lb *(50 kg)*	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 10.00-16; 6; 32 *(220)*	Two 10.00-16; 6; 32 *(220)*
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	None	None
Height of Drawbar		21 in *(535 mm)*	21 in *(535 mm)*
Static Weight with Operator	—Rear	10830 lb *(4912 kg)*	8400 lb *(3810 kg)*
	Front	3410 lb *(1547 kg)*	3410 lb *(1547 kg)*
	Total	14240 lb *(6459 kg)*	11810 lb *(5357 kg)*

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump return was 154°F *(67.7°C)*. Five gears were chosen between 15% slip and 10 mph *(16.1 km/h)*.

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1361.**

LOUIS I. LEVITICUS
Engineer-in Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

4240
JOHN DEERE

John Deere 4240 Syncro Range Diesel

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Roy G. Arnold, Director

NEBRASKA TRACTOR TEST 1362 — JOHN DEERE 4240 POWER SHIFT DIESEL 8 SPEED

POWER TAKE-OFF PERFORMANCE

Power Hp *(kW)*	Crank shaft speed rpm	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temperature °F *(°C)* Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg *(kPa)*
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—1011 rpm)								
111.06 *(82.82)*	2200	7.822 *(29.608)*	0.492 *(0.299)*	14.20 *(2.797)*	193 *(89.3)*	62 *(16.7)*	75 *(23.9)*	29.030 *(98.030)*
Standard Power Take-off Speed (1000 rpm)—One Hour								
111.43 *(83.09)*	2176	7.744 *(29.315)*	0.485 *(0.295)*	14.39 *(2.834)*	193 *(89.4)*	62 *(16.7)*	75 *(23.9)*	29.050 *(98.097)*
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
97.40 *(72.63)*	2272	7.064 *(26.740)*	0.506 *(0.308)*	13.79 *(2.716)*	189 *(87.2)*	62 *(16.7)*	75 *(23.9)*	....
0.00 *(0.00)*	2365	2.685 *(10.166)*	....	....	178 *(80.8)*	62 *(16.7)*	75 *(23.6)*	....
49.98 *(37.37)*	2333	4.744 *(17.956)*	0.663 *(0.403)*	10.54 *(2.076)*	183 *(83.6)*	62 *(16.7)*	75 *(23.9)*	....
111.93 *(83.47)*	2200	7.824 *(29.619)*	0.488 *(0.297)*	14.31 *(2.818)*	193 *(89.4)*	62 *(16.7)*	76 *(24.4)*	....
25.20 *(18.79)*	2350	3.717 *(14.069)*	1.030 *(0.626)*	6.78 *(1.336)*	179 *(81.4)*	62 *(16.7)*	75 *(23.9)*	....
74.13 *(55.28)*	2305	5.848 *(22.137)*	0.551 *(0.335)*	12.68 *(2.497)*	186 *(85.3)*	62 *(16.7)*	75 *(23.9)*	....
Av 59.77 ***Av (44.57)***	**2304**	**5.314** ***(20.114)***	**0.621** ***(0.378)***	**11.25** ***(2.216)***	**184** ***(84.6)***	**62** ***(16.7)***	**75** ***(23.9)***	**29.040** ***(98.064)***

DRAWBAR PERFORMANCE

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption			Temp. °F *(°C)*			Barom. inch Hg *(kPa)*
					gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Cool-ing med	Air wet bulb	Air dry bulb	
Maximum Available Power—Two Hours 4th Gear											
92.70 *(69.12)*	7692 *(34.21)*	4.52 *(7.27)*	2199	6.38	7.645 *(28.938)*	0.576 *(0.350)*	12.13 *(2.389)*	195 *(90.6)*	73 *(22.5)*	78 *(25.3)*	28.965 *(97.810)*
75% of Pull at Maximum Power—Ten Hours 4th Gear											
76.14 *(56.77)*	5961 *(26.51)*	4.79 *(7.71)*	2286	4.60	6.535 *(24.738)*	0.599 *(0.365)*	11.65 *(2.295)*	193 *(89.2)*	71 *(21.4)*	86 *(29.8)*	28.836 *(97.375)*
50% of Pull at Maximum Power—Two Hours 4th Gear											
52.79 *(39.36)*	4001 *(17.80)*	4.95 *(7.96)*	2323	3.09	5.210 *(19.721)*	0.689 *(0.419)*	10.13 *(1.996)*	185 *(84.7)*	73 *(22.8)*	79 *(25.8)*	28.940 *(97.726)*
50% of Pull at Reduced Engine Speed—Two Hours 6th Gear											
52.50 *(39.15)*	3982 *(17.71)*	4.94 *(7.96)*	1374	2.98	3.795 *(14.367)*	0.505 *(0.307)*	13.83 *(2.725)*	187 *(86.1)*	75 *(23.6)*	82 *(27.5)*	28.915 *(97.642)*
MAXIMUM POWER IN SELECTED GEARS											
70.93 *(52.89)*	12450 *(55.38)*	2.14 *(3.44)*	2298	14.77		2nd. Gear		185 *(84.7)*	64 *(17.8)*	70 *(21.1)*	28.890 *(97.557)*
93.57 *(69.78)*	10365 *(46.11)*	3.39 *(5.45)*	2200	9.29		3rd Gear		193 *(89.2)*	68 *(20.0)*	72 *(22.2)*	28.980 *(97.861)*
95.65 *(71.33)*	7947 *(35.35)*	4.51 *(7.26)*	2197	6.48		4th Gear		193 *(89.4)*	67 *(17.4)*	70 *(21.1)*	28.980 *(97.861)*
93.89 *(70.01)*	5854 *(26.04)*	6.01 *(9.68)*	2200	4.58		5th Gear		193 *(89.4)*	69 *(20.6)*	73 *(22.8)*	28.980 *(97.861)*
93.79 *(69.94)*	4464 *(19.86)*	7.88 *(12.68)*	2200	3.35		6th Gear		194 *(90.0)*	71 *(21.7)*	75 *(23.9)*	28.980 *(97.861)*

LUGGING ABILITY IN 4th GEAR

Crankshaft Speed rpm	2197	1981	1757	1541	1317	1095
Pull—lbs *(kN)*	7947 *(35.35)*	8694 *(38.67)*	9252 *(41.16)*	9304 *(41.39)*	9331 *(41.51)*	9258 *(41.18)*
Increase in Pull %	0	9	16	17	17	16
Power—Hp *(kW)*	95.65 *(71.33)*	93.57 *(69.77)*	87.72 *(65.41)*	77.28 *(57.62)*	66.17 *(49.34)*	54.61 *(40.72)*
Speed— Mph *(km/h)*	4.51 *(7.26)*	4.04 *(6.50)*	3.56 *(5.72)*	3.11 *(5.01)*	2.66 *(4.28)*	2.21 *(3.56)*
Slip %	6.48	7.23	7.77	8.04	8.17	8.04

Department of Agricultural Engineering

Dates of Test: August 20 to September 3, 1980, Cab sound test No. 80-5, November 20, 1980

Manufacturer: JOHN DEERE WATERLOO TRACTOR WORKS, P.O. Box 270, Waterloo, Iowa 50704

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 47.9 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60°** ***(15°/15°)*** 0.8386 **Fuel weight** 6.982 lbs/gal *(0.837 kg/l)* **Oil SAE** 30 **API service classification** CD, CC and SD **To motor** 4.372 gal *(16.548 l)* **Drained from motor** 3.743 gal *(14.167 l)* **Transmission and final drive lubricant** John Deere Hy-Gard **Total time engine was operated** 32.5 hours

ENGINE: Make John Deere Diesel **Type** six cylinder vertical **Serial No.** 6466DR-02 144778RG **Crankshaft** lengthwise **Rated rpm** 2200 **Bore and stroke** 4.56″ × 4.75″ *(115.8 mm × 120.6 mm)* **Compression ratio** 17.0 to 1 **Displacement** 466 cu in *(7636 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements with dust evacuator **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for transmission and hydraulic oil **Fuel filter** one paper element **Muffler** vertical **Cooling medium temperature control** two thermostats.

CHASSIS: Type standard with duals **Serial No.** 4240P 019519R **Tread width** rear 60″ *(1524 mm)* to 118.4″ *(3004 mm)* front 56″ *(1422 mm)* to 82″ *(2083 mm)* **Wheel base** 106.7″ *(2709 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 30.1″ *(765 mm)* Vertical distance above roadway 40.1″ *(1019 mm)* Horizontal distance from center of rear wheel tread 0.1″ *(2 mm)* to the left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with full range power shift **Advertised speeds mph *(km/h)*** first 1.7 *(2.7)* second 2.4 *(3.9)* third 3.8 *(6.0)* fourth 4.8 *(7.8)* fifth 6.3 *(10.2)* sixth 8.2 *(13.2)* seventh 10.7 *(17.2)* eighth 18.1 *(29.1)* reverse 2.1 *(3.3)*, 2.9 *(4.7)*, 4.6 *(7.4)*, 5.9 *(9.5)* **Clutch** wet multiple disc hydraulically power actuated and operated by foot pedal **Brakes** wet disc hydraulically power actuated and operated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 143.9″ *(3.66 m)* left 143.9″ *(3.66 m)* (on concrete surface without brake) right 161.8″ *(4.11 m)* left 161.8″ *(4.11 m)* **Turning space diameter** (on concrete surface with brake applied) right 293.3″ *(7.45 m)* left 293.3″ *(7.45 m)* (on concrete surface without brake) right 334.6″ *(8.50 m)* left 334.6″ *(8.50 m)* **Power take-off** 1000 rpm at 2176 engine rpm and 540 rpm at 2182 engine rpm.

REPAIRS and ADJUSTMENTS: During preliminary PTO test, the hydraulic pump seal drain

TRACTOR SOUND LEVEL	With Cab dB(A)	W/O Cab dB(A)
Maximum Available Power—Two Hours	79.0	96.5
75% of Pull at Maximum Power—Ten Hours	79.0	96.5
50% of Pull at Maximum Power—Two Hours	78.0	96.5
50% of Pull at Reduced Engine Speed—Two Hours	74.5	92.0
Bystander in 8th gear	91.0	89.5

TIRES, BALLAST AND WEIGHT		**With Ballast**	**Without Ballast**
Rear Tires	—No., size, ply & psi *(kPa)*	Four 18.4-34; 6; 12 *(85)*	Four 18.4-34; 6; 12 *(85)*
Ballast	—Liquid (each inner)	1000 lb *(454 kg)*	None
	—Cast Iron (each)	110 lb *(50 kg)*	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 10.00-16; 6; 32 *(220)*	Two 10.00-16; 6; 32 *(220)*
Ballast	—Liquid (each)	None	None
	Cast Iron (each)	None	None
Height of Drawbar		21 in *(535 mm)*	21 in *(535 mm)*
Static Weight with Operator	—Rear	10880 lb *(4935 kg)*	8440 lb *(3828 kg)*
	—Front	3380 lb *(1533 kg)*	3380 lb *(1533 kg)*
	—Total	14260 lb *(6468 kg)*	11820 lb *(5361 kg)*

tube failed. This tube was replaced following the PTO tests.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump return was 144°F *(62.2°C)*. Five gears were chosen between 15% slip and 10 mph *(16.1 km/h)*.

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1362.**

LOUIS I. LEVITICUS
Engineer-in-Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

4240
JOHN DEERE

John Deere 4240 Power Shift Diesel

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Roy G. Arnold, Director

NEBRASKA TRACTOR TEST 1363 — MASSEY-FERGUSON MF205 DIESEL 6 SPEED

POWER TAKE-OFF PERFORMANCE

	Power Hp *(kW)*	Crank shaft speed rpm	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temperature °F (°C) Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg *(kPa)*
MAXIMUM POWER AND FUEL CONSUMPTION									
Rated Engine Speed—Two Hours (PTO Speed—548 rpm)									
	16.56 *(12.35)*	2400	1.288 *(4.876)*	0.543 *(0.330)*	12.86 *(2.533)*	176 *(80.2)*	58 *(14.3)*	75 *(24.0)*	28.917 *(97.647)*
Standard Power Take-off Speed (540 rpm)—One Hour									
	16.34 *(12.18)*	2367	1.260 *(4.770)*	0.538 *(0.327)*	12.97 *(2.553)*	176 *(79.8)*	58 *(14.2)*	75 *(23.9)*	28.905 *(97.608)*
VARYING POWER AND FUEL CONSUMPTION—Two Hours									
	14.55 *(10.85)*	2482	1.213 *(4.592)*	0.581 *(0.354)*	12.00 *(2.363)*	171 *(76.9)*	58 *(14.4)*	75 *(23.9)*	....
	0.00 *(0.00)*	2578	0.507 *(1.919)*	....	....	138 *(58.6)*	58 *(14.4)*	75 *(23.6)*	....
	7.39 *(5.51)*	2518	0.839 *(3.176)*	0.792 *(0.482)*	8.81 *(1.735)*	150 *(65.6)*	58 *(14.4)*	74 *(23.3)*	....
	16.43 *(12.25)*	2400	1.307 *(4.948)*	0.555 *(0.338)*	12.56 *(2.476)*	175 *(79.4)*	58 *(14.4)*	74 *(23.3)*	....
	3.74 *(2.79)*	2548	0.679 *(2.570)*	1.269 *(0.772)*	5.50 *(1.086)*	145 *(62.5)*	59 *(15.0)*	75 *(23.9)*	....
	10.97 *(8.18)*	2496	0.972 *(3.679)*	0.618 *(0.376)*	11.29 *(2.223)*	159 *(70.6)*	59 *(15.0)*	75 *(23.9)*	....
Av ***Av***	**8.85** ***(6.60)***	**2504**	**0.920** ***(3.483)***	**0.725** ***(0.441)***	**9.62** ***(1.895)***	**156** ***(68.9)***	**58** ***(14.6)***	**75** ***(23.7)***	**28.920** ***(97.659)***

DRAWBAR PERFORMANCE

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temp. °F (°C) Cooling med	Air wet bulb	Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power—Two Hours 5th (H2) Gear											
12.87 *(9.60)*	1101 *(4.90)*	4.38 *(7.06)*	2398	7.55	1.290 *(4.884)*	0.699 *(0.425)*	9.98 *(1.965)*	167 *(75.0)*	60 *(15.3)*	70 *(20.8)*	29.085 *(98.216)*
75% of Pull at Maximum Power—Ten Hours 5th (H2) Gear											
10.69 *(7.97)*	866 *(3.85)*	4.63 *(7.45)*	2479	5.51	1.107 *(4.192)*	0.723 *(0.440)*	9.65 *(1.902)*	155 *(68.5)*	60 *(15.4)*	64 *(17.7)*	28.857 *(97.446)*
50% of Pull at Maximum Power—Two Hours 5th (H2) Gear											
7.34 *(5.48)*	579 *(2.58)*	4.75 *(7.65)*	2508	4.15	0.914 *(3.459)*	0.868 *(0.528)*	8.03 *(1.583)*	145 *(62.5)*	55 *(12.5)*	63 *(16.9)*	28.930 *(97.692)*
50% of Pull at Reduced Engine Speed—Two Hours 6th (H3) Gear											
7.36 *(5.49)*	581 *(2.59)*	4.75 *(7.64)*	1597	3.80	0.645 *(2.442)*	0.611 *(0.372)*	11.41 *(2.248)*	159 *(70.6)*	62 *(16.4)*	78 *(25.3)*	28.910 *(97.625)*
MAXIMUM POWER IN SELECTED GEARS											
7.78 *(5.80)*	1995 *(8.87)*	1.46 *(2.35)*	2502	14.81	3rd (L3) Gear			138 *(58.6)*	48 *(8.9)*	50 *(10.0)*	28.930 *(97.692)*
12.92 *(9.63)*	1915 *(8.52)*	2.53 *(4.07)*	2400	13.97	4th (H1) Gear			154 *(67.8)*	51 *(10.6)*	55 *(12.8)*	28.930 *(97.692)*
13.45 *(10.03)*	1150 *(5.11)*	4.39 *(7.06)*	2399	7.51	5th (H2) Gear			161 *(71.4)*	53 *(11.7)*	61 *(16.1)*	29.090 *(98.233)*
12.93 *(9.64)*	684 *(3.04)*	7.09 *(11.40)*	2399	4.41	6th (H3) Gear			164 *(73.1)*	56 *(13.3)*	65 *(18.3)*	29.090 *(98.233)*

LUGGING ABILITY IN 5th (H2) GEAR

Crankshaft Speed rpm	2399	2165	1919	1688	1440	1196
Pull—lbs *(kN)*	1150 *(5.11)*	1177 *(5.23)*	1352 *(6.01)*	1353 *(6.02)*	1337 *(5.95)*	1325 *(5.89)*
Increase in Pull %	0	2	18	18	16	15
Power—Hp *(kW)*	13.45 *(10.03)*	12.40 *(9.24)*	12.42 *(9.26)*	10.91 *(8.13)*	9.22 *(6.87)*	7.59 *(5.66)*
Speed—Mph *(km/h)*	4.39 *(7.06)*	3.95 *(6.36)*	3.45 *(5.55)*	3.02 *(4.87)*	2.59 *(4.16)*	2.15 *(3.46)*
Slip %	7.51	7.63	9.16	9.48	9.16	9.09

Department of Agricultural Engineering

Dates of Test: September 18 to October 3, 1980

Manufacturer: TOYOSHA COMPANY LTD, 55 Joshoji-16, Kadoma City, Osaka, Japan

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 47.9 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60°** *(15°/15°)* 0.8378 **Fuel weight** 6.976 lbs/gal *(0.836 kg/l)* **Oil SAE** 20-20W **API service classification** SB/SE-CA/CC **To motor** 0.845 gal *(3.199 l)* **Drained from motor** 0.746 gal *(2.825 l)* **Transmission and final drive lubricant** Massey Ferguson Permatran fluid **Total time engine was operated** 35.0 hours

ENGINE: Make Toyosha Diesel **Type** two cylinder vertical **Serial No.** S107-01859 **Crankshaft** lengthwise **Rated rpm** 2400 **Bore and stroke** 3.46" × 3.46" *(88 mm × 88 mm)* **Compression ratio** 23 to 1 **Displacement** 65.2 cu in *(1069 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** one paper element **Oil filter** one paper cartridge **Fuel filter** one paper cartridge **Muffler** vertical **Cooling medium temperature control** none

CHASSIS: Type standard **Serial No.** 01267 **Tread width** rear 35.4" *(900 mm)* or 40.2" *(1020 mm)* front 35.8" *(910 mm)* **Wheel base** 55.3" *(1405 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 21.4" *(544 mm)* Vertical distance above roadway 24.5" *(622 mm)* Horizontal distance from center of rear wheel tread 0" *(0 mm)* to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph (km/h)** first 0.7 *(1.1)* second 1.1 *(1.8)* third 1.7 *(2.7)* fourth 3.0 *(4.8)* fifth 4.9 *(7.9)* sixth 7.7 *(12.4)* reverse 1.6 *(2.6)*, 7.0 *(11.3)* **Clutch** dry disc operated by foot pedal **Brakes** drum and shoe operated by two foot pedals which can be locked together **Steering** mechanical **Turning radius** (on concrete surface with brake applied) right 74.4" *(1.89 m)* left 75.6" *(1.92 m)* (on concrete surface without brake) right 84.9" *(2.16 m)* left 86.3" *(2.19 m)* **Turning space diameter** (on concrete surface with brake applied) right 159.5" *(4.05 m)* left 162.0" *(4.11 m)* (on concrete surface without brake) right 179.5" *(4.56 m)* left 182.2" *(4.63 m)* **Power take-off** 540 rpm at 2367 engine rpm.

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump was 131°F *(55.2°C)*. Four gears were chosen between 15% slip and 10 mph *(16.1 km/h)*. During final

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)
Maximum Available Power—Two Hours	93.5
75% of Pull at Maximum Power—Ten Hours	95.0
50% of Pull at Maximum Power—Two Hours	94.0
50% of Pull at Reduced Engine Speed—Two Hours	89.5
Bystander in 6th (H3) gear	77.5

TIRES, BALLAST AND WEIGHT		**With Ballast**	**Without Ballast**
Rear Tires	—No., size, ply & psi *(kPa)*	Two 8.3/8-24; 4; 14 *(95)*	Two 8.3/8-24; 4; 14 *(95)*
Ballast	—Liquid (each)	145 lb *(66 kg)*	None
	—Cast Iron (each)	270 lb *(122 kg)*	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 4.00-12; 4; 44 *(305)*	Two 4.00-12; 4; 44 *(305)*
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	52 lb *(24 kg)*	None
Height of Drawbar		11.5 in *(290 mm)*	11.5 in *(290 mm)*
Static Weight with Operator	—Rear	2035 lb *(923 kg)*	1205 lb *(547 kg)*
	—Front	805 lb *(365 kg)*	700 lb *(317 kg)*
	—Total	2840 lb *(1288 kg)*	1905 lb *(864 kg)*

inspection both cylinder walls were found to be slightly scratched.

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1363.**

LOUIS I. LEVITICUS
Engineer-in-Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

Massey-Ferguson MF205 Diesel

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Roy G. Arnold, Director

NEBRASKA TRACTOR TEST 1364 — MASSEY-FERGUSON MF205-4 DIESEL
6 SPEED

POWER TAKE-OFF PERFORMANCE

	Power Hp *(kW)*	Crank shaft speed rpm	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temperature °F (°C) Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg *(kPa)*
MAXIMUM POWER AND FUEL CONSUMPTION									
Rated Engine Speed—Two Hours (PTO Speed—548 rpm)									
	16.40 *(12.23)*	2400	1.289 *(4.879)*	0.548 *(0.333)*	12.73 *(2.507)*	189 *(87.0)*	65 *(18.2)*	75 *(23.8)*	28.870 *(97.490)*
Standard Power Take-off Speed (540 rpm)—One Hour									
	16.18 *(12.07)*	2366	1.261 *(4.773)*	0.544 *(0.331)*	12.83 *(2.529)*	189 *(87.2)*	65 *(18.3)*	75 *(24.1)*	28.880 *(97.523)*
VARYING POWER AND FUEL CONSUMPTION—Two Hours									
	14.38 *(10.72)*	2478	1.165 *(4.410)*	0.565 *(0.344)*	12.34 *(2.431)*	183 *(83.6)*	65 *(18.3)*	75 *(23.9)*	....
	0.00 *(0.00)*	2568	0.507 *(1.919)*	....	....	146 *(63.3)*	65 *(18.3)*	75 *(23.9)*	....
	7.30 *(5.44)*	2516	0.821 *(3.108)*	0.785 *(0.478)*	8.89 *(1.750)*	161 *(71.7)*	65 *(18.3)*	75 *(23.9)*	....
	16.44 *(12.26)*	2401	1.294 *(4.898)*	0.549 *(0.334)*	12.70 *(2.503)*	188 *(86.7)*	65 *(18.3)*	75 *(23.9)*	....
	3.70 *(2.76)*	2546	0.667 *(2.525)*	1.257 *(0.765)*	5.55 *(1.093)*	155 *(68.1)*	66 *(18.6)*	76 *(24.2)*	....
	10.86 *(8.10)*	2493	0.981 *(3.713)*	0.630 *(0.383)*	11.08 *(2.182)*	170 *(76.7)*	65 *(18.3)*	75 *(23.9)*	....
Av ***Av***	**8.78** ***(6.55)***	**2500**	**0.906** ***(3.430)***	**0.720** ***(0.438)***	**9.69** ***(1.910)***	**167** ***(75.0)***	**65** ***(18.4)***	**75** ***(23.9)***	**28.860** ***(97.456)***

DRAWBAR PERFORMANCE
(Front Wheel Drive Disengaged)

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temp. °F (°C) Cool-ing med	Air wet bulb	Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power—Two Hours 5th (H2) Gear											
12.78 *(9.53)*	983 *(4.37)*	4.87 *(7.84)*	2400	5.55	1.272 *(4.816)*	0.695 *(0.423)*	10.04 *(1.978)*	184 *(84.2)*	60 *(15.6)*	78 *(25.3)*	29.070 *(98.165)*
75% of Pull at Maximum Power--Ten Hours 5th (H2) Gear											
10.73 *(8.00)*	785 *(3.49)*	5.13 *(8.25)*	2484	4.04	1.122 *(4.246)*	0.729 *(0.444)*	9.57 *(1.885)*	174 *(78.9)*	58 *(14.3)*	75 *(23.8)*	28.937 *(97.716)*
50% of Pull at Maximum Power—Two Hours 5th (H2) Gear											
7.33 *(5.47)*	525 *(2.33)*	5.24 *(8.44)*	2515	3.08	0.914 *(3.459)*	0.869 *(0.529)*	8.02 *(1.581)*	148 *(64.4)*	49 *(9.4)*	58 *(14.4)*	28.835 *(97.371)*
50% of Pull at Reduced Engine Speed—Two Hours 6th (H3) Gear											
7.40 *(5.52)*	528 *(2.35)*	5.26 *(8.46)*	1466	2.72	0.717 *(2.713)*	0.676 *(0.411)*	10.32 *(2.033)*	166 *(74.2)*	57 *(13.9)*	74 *(23.3)*	28.850 *(97.422)*
MAXIMUM POWER IN SELECTED GEARS											
9.91 *(7.39)*	2131 *(9.48)*	1.74 *(2.81)*	2494	14.84		3rd (L3) Gear		149 *(64.7)*	46 *(7.8)*	50 *(10.0)*	29.030 *(98.030)*
13.23 *(9.87)*	1735 *(7.72)*	2.86 *(4.60)*	2401	10.51		4th (H1) Gear		178 *(81.1)*	57 *(13.9)*	70 *(21.1)*	29.080 *(98.199)*
13.57 *(10.12)*	1047 *(4.66)*	4.86 *(7.82)*	2402	5.80		5th (H2) Gear		173 *(78.1)*	53 *(11.7)*	63 *(17.2)*	29.070 *(98.165)*
12.45 *(9.28)*	545 *(2.42)*	8.57 *(13.79)*	2401	3.15		6th (H3) Gear		181 *(82.5)*	58 *(14.4)*	73 *(22.8)*	29.080 *(98.199)*

LUGGING ABILITY IN 5th (H2) GEAR

Crankshaft Speed rpm	2402	2162	1919	1681	1440	1189
Pull—lbs *(kN)*	1047 *(4.66)*	1097 *(4.88)*	1215 *(5.40)*	1240 *(5.51)*	1199 *(5.33)*	1165 *(5.18)*
Increase in Pull %	0	5	16	18	14	11
Power—Hp *(kW)*	13.57 *(10.12)*	12.77 *(9.52)*	12.43 *(9.27)*	11.09 *(8.27)*	9.21 *(6.87)*	7.41 *(5.52)*
Speed—Mph *(km/h)*	4.86 *(7.82)*	4.36 *(7.02)*	3.84 *(6.18)*	3.35 *(5.40)*	2.88 *(4.64)*	2.39 *(3.84)*
Slip %	5.80	6.23	7.06	7.22	6.89	6.73

Department of Agricultural Engineering

Dates of Test: September 24 to October 9, 1980

Manufacturer: TOYOSHA COMPANY LTD, 55 Joshoji-16, Kadoma City, Osaka Japan

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 47.9 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60°** ***(15°/15°)*** 0.8379 **Fuel weight** 6.976 lbs/gal *(0.836 kg/l)* **Oil SAE** 20-20W **API service classification** SB/SE-CA/CC **To motor** 0.824 gal *(3.120 l)* **Drained from motor** 0.772 gal *(2.922 l)* **Transmission and final drive lubricant** Massey Ferguson Permatran fluid **Total time engine was operated** 36.5 hours

ENGINE: Make Toyosha Diesel **Type** two cylinder vertical **Serial No.** S 107 MO 1709 **Crankshaft** lengthwise **Rated rpm** 2400 **Bore and stroke** 3.46" × 3.46" *(88 mm × 88 mm)* **Compression ratio** 23 to 1 **Displacement** 65.2 cu in *(1069 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** one paper element **Oil filter** one full flow paper cartridge **Fuel filter** one paper cartridge **Muffler** vertical **Cooling medium temperature control** none

CHASSIS: Type front wheel assist **Serial No.** 00680 **Tread width** rear 35.4" *(900 mm)* or 40.2" *(1020 mm)* front 38" *(965 mm)* **Wheel base** 54.9" *(1395 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 23.9" *(607 mm)* Vertical distance above roadway 24.9" *(632 mm)* Horizontal distance from center of rear wheel tread 0" *(0 mm)* to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph** ***(km/h)*** first 0.7 *(1.1)* second 1.2 *(1.9)* third 2.0 *(3.2)* fourth 3.3 *(5.3)* fifth 5.4 *(8.7)* sixth 9.2 *(14.8)* reverse 1.7 *(2.7)*, 7.7 *(12.4)* **Clutch** dry disc operated by foot pedal **Brakes** drum and shoe operated by two foot pedals which can be locked together **Steering** mechanical **Turning radius** (on concrete surface with brake applied) right 86.5" *(2.20 m)* left 86.3" *(2.19 m)* (on concrete surface without brake) right 96.5" *(2.45 m)* left 100.5" *(2.55 m)* **Turning space diameter** (on concrete surface with brake applied) right 186.5" *(4.74 m)* left 185" *(4.70 m)* (on concrete surface without brake) right 206.5" *(5.25 m)* left 214.5" *(5.45 m)* **Power take-off** 540 rpm at 2366 engine rpm.

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump was 131°F *(54.7°C)*. Four gears were chosen between 15% slip and 10 mph *(16.1 km/h)*.

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)	Front Wheel Drive Disengaged dB(A)
Maximum Available Power—Two Hours	95.0	95.5
75% of Pull at Maximum Power—Ten Hours		94.0
50% of Pull at Maximum Power—Two Hours		94.5
50% of Pull at Reduced Engine Speed—Two Hours		92.0
Bystander in 6th (H3) gear		77.0

DRAWBAR PERFORMANCE (Front Wheel Drive Engaged)

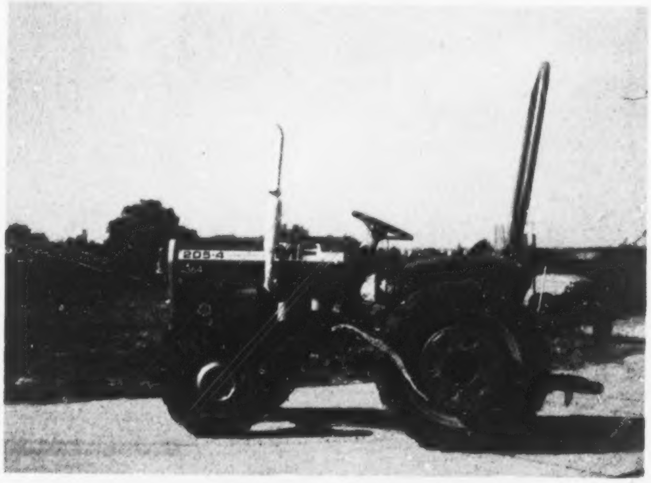
Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temp. °F (°C) Cool-ing med	Air wet bulb	Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power—Two Hours 5th (H2) Gear											
12.75 *(9.50)*	958 *(4.26)*	4.99 *(8.03)*	2399	4.13	1.218 *(4.612)*	0.667 *(0.406)*	10.46 *(2.061)*	187 *(85.8)*	61 *(16.1)*	80 *(26.7)*	29.060 *(98.131)*
MAXIMUM POWER IN SELECTED GEARS											
11.86 *(8.84)*	2557 *(11.38)*	1.74 *(2.80)*	2461	14.73		3rd (L3) Gear		156 *(68.9)*	50 *(10.0)*	56 *(13.3)*	29.060 *(98.131)*
13.49 *(10.06)*	1016 *(4.52)*	4.98 *(8.01)*	2402	4.50		5th (H2) Gear		176 *(80.0)*	55 *(12.8)*	67 *(19.4)*	29.070 *(98.165)*

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi *(kPa)*	Two 8.3/8-24; 4; 16 *(110)*	Two 8.3/8-24; 4; 16 *(110)*
Ballast	—Liquid (each)	140 lb *(64 kg)*	None
	—Cast Iron (each)	260 lb *(118 kg)*	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 6-14; 4; 20 *(140)*	Two 6-14; 4; 20 *(140)*
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	53 lb *(24 kg)*	None
Height of Drawbar		11.5 in *(290 mm)*	11.5 in *(290 mm)*
Static Weight with Operator	—Rear	2094 lb *(950 kg)*	1295 lb *(587 kg)*
	—Front	1026 lb *(465 kg)*	920 lb *(417 kg)*
	—Total	3120 lb *(1415 kg)*	2215 lb *(1004 kg)*

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1364.**

LOUIS I. LEVITICUS
Engineer-in-Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers



Massey-Ferguson MF205-4 Diesel

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Roy G. Arnold, Director

NEBRASKA TRACTOR TEST 1365 — MASSEY-FERGUSON MF210 DIESEL
12 SPEED

POWER TAKE-OFF PERFORMANCE

Power Hp *(kW)*	Crank shaft speed rpm	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temperature °F (°C) Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg *(kPa)*
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—580 rpm)								
21.96 *(16.38)*	2500	1.650 *(6.246)*	0.524 *(0.319)*	13.31 *(2.622)*	171 *(77.1)*	59 *(15.1)*	75 *(24.0)*	28.750 *(97.084)*
Standard Power Take-off Speed (540 rpm)—One Hour								
21.23 *(15.83)*	2326	1.560 *(5.905)*	0.513 *(0.312)*	13.61 *(2.681)*	171 *(77.2)*	60 *(15.3)*	75 *(23.9)*	28.755 *(97.101)*
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
19.42 *(14.48)*	2598	1.466 *(5.549)*	0.527 *(0.320)*	13.24 *(2.609)*	168 *(75.3)*	60 *(15.6)*	75 *(23.9)*	....
0.00 *(0.00)*	2730	0.499 *(1.889)*	....	....	159 *(70.6)*	60 *(15.6)*	75 *(23.9)*	....
9.90 *(7.38)*	2648	0.925 *(3.502)*	0.652 *(0.397)*	10.70 *(2.107)*	163 *(72.8)*	60 *(15.6)*	75 *(23.9)*	....
22.01 *(16.41)*	2500	1.669 *(6.318)*	0.529 *(0.322)*	13.19 *(2.597)*	170 *(76.7)*	60 *(15.6)*	75 *(23.9)*	....
5.03 *(3.75)*	2685	0.710 *(2.688)*	0.985 *(0.599)*	7.08 *(1.395)*	160 *(70.8)*	60 *(15.3)*	75 *(23.6)*	....
14.70 *(10.96)*	2622	1.165 *(4.410)*	0.553 *(0.336)*	12.61 *(2.485)*	165 *(73.9)*	60 *(15.6)*	75 *(23.9)*	....
Av 11.84 ***Av (8.83)***	**2631**	**1.072** ***(4.058)***	**0.632** ***(0.384)***	**11.04** ***(2.176)***	**164** ***(73.3)***	**60** ***(15.5)***	**75** ***(23.8)***	**28.780** ***(97.186)***

DRAWBAR PERFORMANCE

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temp. °F (°C) Cool-ing med	Air wet bulb	Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power—Two Hours 10th (H2) Gear											
17.28 *(12.89)*	1113 *(4.95)*	5.82 *(9.37)*	2498	7.14	1.595 *(6.037)*	0.644 *(0.392)*	10.84 *(2.135)*	170 *(76.7)*	66 *(18.6)*	82 *(27.5)*	28.910 *(97.625)*
75% of Pull at Maximum Power—Ten Hours 10th (H2) Gear											
14.30 *(10.66)*	877 *(3.90)*	6.12 *(9.84)*	2578	5.43	1.358 *(5.141)*	0.663 *(0.403)*	10.53 *(2.074)*	170 *(76.4)*	71 *(21.7)*	83 *(28.4)*	28.734 *(97.030)*
50% of Pull at Maximum Power—Two Hours 10th (H2) Gear											
9.90 *(7.38)*	581 *(2.59)*	6.38 *(10.27)*	2637	3.55	1.057 *(4.002)*	0.745 *(0.453)*	9.36 *(1.844)*	165 *(73.9)*	68 *(19.7)*	76 *(24.2)*	28.615 *(96.629)*
50% of Pull at Reduced Engine Speed—Two Hours 11th (H3) Gear											
9.76 *(7.28)*	574 *(2.55)*	6.37 *(10.26)*	2009	3.40	0.860 *(3.256)*	0.615 *(0.374)*	11.35 *(2.235)*	167 *(74.7)*	70 *(21.1)*	85 *(29.4)*	28.575 *(96.493)*
MAXIMUM POWER IN SELECTED GEARS											
13.53 *(10.09)*	2159 *(9.60)*	2.35 *(3.78)*	2608	14.97		8th (M4) Gear		164 *(73.3)*	66 *(18.9)*	68 *(20.0)*	28.620 *(96.645)*
17.49 *(13.04)*	1663 *(7.40)*	3.94 *(6.35)*	2502	11.47		9th (H1) Gear		170 *(76.4)*	64 *(17.8)*	80 *(26.7)*	28.930 *(97.692)*
18.08 *(13.48)*	1167 *(5.19)*	5.81 *(9.35)*	2498	7.39		10th (H2) Gear		169 *(76.1)*	62 *(16.7)*	77 *(25.0)*	28.920 *(97.659)*
17.92 *(13.36)*	866 *(3.85)*	7.76 *(12.49)*	2499	5.47		11th (H3) Gear		169 *(76.1)*	64 *(17.8)*	79 *(26.1)*	28.920 *(97.659)*

LUGGING ABILITY IN 10th (H2) GEAR

Crankshaft Speed rpm	2498	2248	1998	1751	1495	1233
Pull—lbs *(kN)*	1167 *(5.19)*	1263 *(5.62)*	1317 *(5.86)*	1337 *(5.95)*	1364 *(6.07)*	1334 *(5.93)*
Increase in Pull %	0	8	13	15	17	14
Power—Hp *(kW)*	18.08 *(13.48)*	17.48 *(13.04)*	16.14 *(12.04)*	14.34 *(10.70)*	12.45 *(9.28)*	10.06 *(7.50)*
Speed—Mph *(km/h)*	5.81 *(9.35)*	5.19 *(8.35)*	4.60 *(7.40)*	4.02 *(6.47)*	3.42 *(5.51)*	2.83 *(4.55)*
Slip %	7.39	8.07	8.25	8.43	8.70	8.52

Department of Agricultural Engineering

Dates of Test: September 15 to 24, 1980

Manufacturer: TOYOSHA COMPANY LTD, 55 Joshoji-16, Kadoma City, Osaka Japan

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 47.9 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60°** ***(15°/15°)*** 0.8378 **Fuel weight** 6.976 lbs/gal *(0.836 kg/l)* **Oil SAE** 20-20W **API service classification** SB/SE-CA/CC **To motor** 1.003 gal *(3.796 l)* **Drained from motor** 0.899 gal *(3.404 l)* **Transmission and final drive lubricant** Massey Ferguson Permatran fluid **Total time engine was operated** 40.0 hours

ENGINE: Make Toyosha Diesel **Type** two cylinder vertical **Serial No.** S 126 MO 2122 **Crankshaft** lengthwise **Rated rpm** 2500 **Bore and stroke** 3.62" × 3.74" *(92 mm × 95 mm)* **Compression ratio** 23 to 1 **Displacement** 77.1 cu in *(1263 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** one paper element **Oil filter** one full flow paper cartridge **Fuel filter** one paper cartridge **Muffler** vertical **Cooling medium temperature control** one thermostat.

CHASSIS: Type standard **Serial No.** 01532 **Tread width** rear 39.2" *(995 mm)* to 51" *(1295 mm)* front 39.8" *(1010 mm)* to 52.2" *(1325 mm)* **Wheel base** 60.2" *(1530 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 23.0" *(584 mm)* Vertical distance above roadway 27.2" *(691 mm)* Horizontal distance from center of rear wheel tread 0" *(0 mm)* to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph** ***(km/h)*** first 0.3 *(0.5)* second 0.4 *(0.6)* third 0.6 *(1.0)* fourth 0.8 *(1.3)* fifth 1.0 *(1.6)* sixth 1.4 *(2.3)* seventh 1.8 *(2.9)* eighth 2.7 *(4.3)* ninth 4.5 *(7.2)* tenth 6.4 *(10.3)* eleventh 8.4 *(13.5)* twelfth 12.4 *(20.0)* reverse 0.6 *(1.0)*, 1.9 *(3.1)*, 8.8 *(14.2)* **Clutch** dry single disc operated by foot pedal **Brakes** drum and shoe operated by two foot pedals which can be locked together **Steering** mechanical **Turning radius** (on concrete surface with brake applied) right 98.8" *(2.51 m)* left 99.1" *(2.52 m)* (on concrete surface without brake) right 111.4" *(2.83 m)* left 112.3" *(2.85 m)* **Turning space diameter** (on concrete surface with brake applied) right 202.5" *(5.14 m)* left 203.5" *(5.17 m)* (on concrete surface without brake) right 228" *(5.79 m)* left 229.8" *(5.84 m)* **Power take-off** 540 rpm at 2326 engine rpm.

REPAIRS and ADJUSTMENTS: The battery failed following the limber up period and was replaced.

REMARKS: All test results were determined from observed data obtained in accordance with

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)
Maximum Available Power—Two Hours	95.0
75% of Pull at Maximum Power—Ten Hours	93.0
50% of Pull at Maximum Power—Two Hours	91.5
50% of Pull at Reduced Engine Speed—Two Hours	91.5
Bystander in 12th (H4) gear	79.0

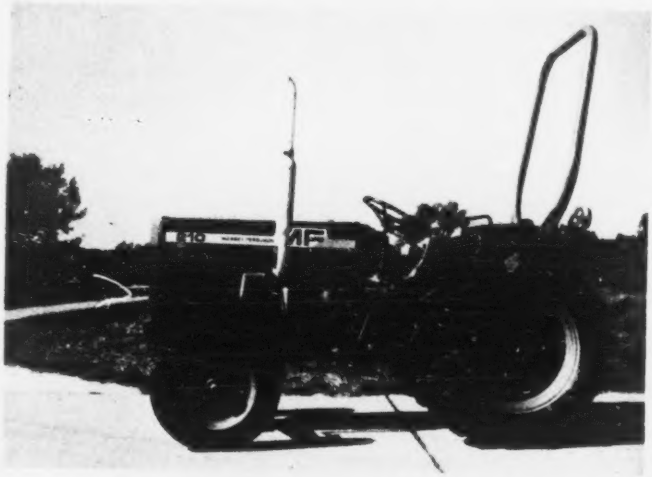
TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi *(kPa)*	Two 11.2/10-24; 4; 14 *(95)*	Two 11.2/10-24; 4; 14 *(95)*
Ballast	—Liquid (each)	295 lb *(133 kg)*	None
	—Cast Iron (each)	198 lb *(90 kg)*	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 5.00-15; 4; 36 *(250)*	Two 5.00-15; 4; 36 *(250)*
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	52 lb *(24 kg)*	None
Height of Drawbar		12.5 in *(320 mm)*	12.5 in *(320 mm)*
Static Weight with Operator	—Rear	2545 lb *(1154 kg)*	1560 lb *(708 kg)*
	—Front	1005 lb *(456 kg)*	900 lb *(408 kg)*
	—Total	3550 lb *(1610 kg)*	2460 lb *(1116 kg)*

SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump was 142°F *(61.2°C)*. Four gears were chosen between 15% slip and 10 mph *(16.1 km/h)*.

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1365.**

LOUIS I. LEVITICUS
Engineer-in-Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers



Massey-Ferguson MF210 Diesel

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Roy G. Arnold, Director

NEBRASKA TRACTOR TEST 1366 — MASSEY-FERGUSON MF210-4 DIESEL 12 SPEED

POWER TAKE-OFF PERFORMANCE

	Power Hp *(kW)*	Crank shaft speed rpm	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temperature °F *(°C)* Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg *(kPa)*
MAXIMUM POWER AND FUEL CONSUMPTION									
Rated Engine Speed—Two Hours (PTO Speed—580 rpm)									
	21.77 *(16.23)*	2500	1.696 *(6.420)*	0.543 *(0.331)*	12.84 *(2.528)*	179 *(81.4)*	60 *(15.4)*	75 *(23.9)*	29.017 *(97.985)*
Standard Power Take-off Speed (540 rpm)—One Hour									
	21.02 *(15.67)*	2326	1.594 *(6.034)*	0.529 *(0.322)*	13.18 *(2.597)*	178 *(80.9)*	59 *(15.0)*	75 *(24.1)*	29.005 *(97.946)*
VARYING POWER AND FUEL CONSUMPTION—Two Hours									
	19.31 *(14.40)*	2608	1.479 *(5.599)*	0.535 *(0.325)*	13.05 *(2.572)*	176 *(79.7)*	59 *(15.0)*	76 *(24.2)*	....
	0.00 *(0.00)*	2735	0.525 *(1.987)*	....	....	169 *(76.1)*	59 *(15.0)*	75 *(23.9)*	....
	9.86 *(7.35)*	2664	0.946 *(3.581)*	0.669 *(0.407)*	10.42 *(2.052)*	173 *(78.3)*	59 *(15.0)*	75 *(23.9)*	....
	21.96 *(16.38)*	2500	1.712 *(6.481)*	0.544 *(0.331)*	12.83 *(2.527)*	178 *(80.8)*	59 *(15.0)*	76 *(24.2)*	....
	5.01 *(3.74)*	2704	0.740 *(2.801)*	1.031 *(0.627)*	6.77 *(1.335)*	171 *(76.9)*	59 *(15.0)*	75 *(23.9)*	....
	14.64 *(10.92)*	2636	1.183 *(4.478)*	0.564 *(0.343)*	12.38 *(2.439)*	174 *(78.9)*	59 *(15.0)*	75 *(23.9)*	....
Av ***Av***	**11.80** ***(8.80)***	**2641**	**1.097** ***(4.153)***	**0.649** ***(0.395)***	**10.75** ***(2.119)***	**173** ***(78.5)***	**59** ***(15.0)***	**75** ***(24.0)***	**29.007** ***(97.951)***

DRAWBAR PERFORMANCE (Front Wheel Drive Disengaged)

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temp. °F *(°C)* Cool-ing med	Air wet bulb	Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power—Two Hours 10th (H2) Gear											
16.97 *(12.65)*	1233 *(5.48)*	5.16 *(8.31)*	2500	9.12	1.702 *(6.444)*	0.700 *(0.426)*	9.97 *(1.963)*	177 *(80.3)*	60 *(15.3)*	74 *(23.3)*	28.850 *(97.422)*
75% of Pull at Maximum Power—Ten Hours 10th (H2) Gear											
14.25 *(10.63)*	963 *(4.28)*	5.55 *(8.94)*	2623	6.74	1.365 *(5.169)*	0.668 *(0.406)*	10.44 *(2.057)*	173 *(78.4)*	50 *(9.8)*	60 *(15.8)*	29.165 *(98.486)*
50% of Pull at Maximum Power—Two Hours 10th (H2) Gear											
9.87 *(7.36)*	641 *(2.85)*	5.77 *(9.29)*	2668	4.68	1.147 *(4.341)*	0.811 *(0.493)*	8.61 *(1.695)*	173 *(78.1)*	48 *(8.6)*	57 *(13.6)*	29.270 *(98.840)*
50% of Pull at Reduced Engine Speed—Two Hours 11th (H3) Gear											
9.93 *(7.41)*	645 *(2.87)*	5.78 *(9.30)*	2041	4.58	0.950 *(3.595)*	0.667 *(0.406)*	10.46 *(2.061)*	170 *(76.7)*	52 *(10.8)*	66 *(18.9)*	29.235 *(98.722)*
MAXIMUM POWER IN SELECTED GEARS											
13.64 *(10.17)*	2158 *(9.60)*	2.37 *(3.81)*	2643	14.72	8th (M4) Gear			168 *(75.6)*	36 *(2.2)*	39 *(3.9)*	29.260 *(98.807)*
17.00 *(12.68)*	1857 *(8.26)*	3.43 *(5.53)*	2500	14.69	9th (H1) Gear			176 *(80.0)*	56 *(13.3)*	67 *(19.4)*	28.900 *(97.591)*
17.60 *(13.13)*	1278 *(5.68)*	5.17 *(8.32)*	2498	8.91	10th (H2) Gear			176 *(80.0)*	52 *(11.1)*	62 *(16.7)*	28.900 *(97.591)*
17.60 *(13.12)*	955 *(4.25)*	6.91 *(11.12)*	2498	6.80	11th (H3) Gear			177 *(80.6)*	57 *(13.9)*	69 *(20.6)*	28.880 *(97.523)*

LUGGING ABILITY IN 10th (H2) GEAR

Crankshaft Speed rpm	2498	2256	2001	1746	1493	1247
Pull—lbs *(kN)*	1278 *(5.68)*	1347 *(5.99)*	1431 *(6.37)*	1482 *(6.59)*	1536 *(6.83)*	1496 *(6.65)*
Increase in Pull %	0	5	12	16	20	17
Power—Hp *(kW)*	17.60 *(13.13)*	16.72 *(12.47)*	15.63 *(11.65)*	14.02 *(10.45)*	12.37 *(9.22)*	10.09 *(7.52)*
Speed—Mph *(km/h)*	5.17 *(8.32)*	4.65 *(7.49)*	4.09 *(6.59)*	3.55 *(5.71)*	3.02 *(4.86)*	2.53 *(4.07)*
Slip %	8.91	9.14	9.94	10.46	10.98	10.63

Department of Agricultural Engineering

Dates of Test: September 17 to October 2, 1980

Manufacturer: TOYOSHA COMPANY LTD, 55 Joshoji-16, Kadoma City, Osaka, Japan

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 47.9 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60°** *(15°/15°)* 0.8378 **Fuel weight** 6.976 lbs/gal *(0.836 kg/l)* **Oil SAE** 20-20W **API service classification** SB/SE-CA/CC **To motor** 1.082 gal *(4.095 l)* **Drained from motor** 1.059 gal *(4.009 l)* **Transmission and final drive lubricant** Massey Ferguson Permatran fluid **Total time engine was operated** 39.5 hours

ENGINE: Make Toyosha Diesel **Type** two cylinder vertical **Serial No.** S 126 MO 1949 **Crankshaft** lengthwise **Rated rpm** 2500 **Bore and stroke** 3.62" × 3.74" *(92 mm × 95 mm)* **Compression ratio** 23 to 1 **Displacement** 77.1 cu in *(1263 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** one paper element **Oil filter** one full flow paper cartridge **Fuel filter** one paper cartridge **Muffler** vertical **Cooling medium temperature control** one thermostat

CHASSIS: Type front wheel assist **Serial No.** 00553 **Tread width** rear 41.5" *(1055 mm)* to 53.3" *(1355 mm)* front 39.6" *(1005 mm)* **Wheel base** 59.4" *(1510 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 24.4" *(620 mm)* Vertical distance above roadway 28.6" *(726 mm)* Horizontal distance from center of rear wheel tread 0" *(0 mm)* to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph *(km/h)*** first 0.3 *(0.5)* second 0.4 *(0.6)* third 0.5 *(0.8)* fourth 0.8 *(1.3)* fifth 1.0 *(1.6)* sixth 1.4 *(2.3)* seventh 1.8 *(2.9)* eighth 2.6 *(4.2)* ninth 4.0 *(6.4)* tenth 5.7 *(9.2)* eleventh 7.4 *(11.9)* twelfth 11.0 *(17.7)* reverse 0.6 *(1.0)*, 1.9 *(3.1)*, 7.8 *(12.6)* **Clutch** dry single disc operated by foot pedal **Brakes** drum and shoe operated by two foot pedals which can be locked together **Steering** mechanical **Turning radius** (on concrete surface with brake applied) right 93.3" *(2.37 m)* left 93.5" *(2.37 m)* (on concrete surface without brake) right 105.6" *(2.68 m)* left 111.4" *(2.83 m)* **Turning space diameter** (on concrete surface with brake applied) right 196.3" *(4.98 m)* left 196.5" *(4.99 m)* (on concrete surface without brake) right 221" *(5.61 m)* left 232.5" *(5.91 m)* **Power take-off** 540 rpm at 2326 engine rpm.

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump was

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)	Front Wheel Drive Disengaged dB(A)
Maximum Available Power—Two Hours	94.5	94.0
75% of Pull at Maximum Power—Ten Hours		92.5
50% of Pull at Maximum Power—Two Hours		91.0
50% of Pull at Reduced Engine Speed—Two Hours		90.0
Bystander in 12th (H4) gear		78.0

DRAWBAR PERFORMANCE
(Front Wheel Drive Engaged)

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr *(l/h)*	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Fuel Consumption Hp.hr/gal *(kW.h/l)*	Temp. °F (°C) Cooling med	Temp. °F (°C) Air wet bulb	Temp. °F (°C) Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power—Two Hours 10th (H2) Gear											
17.22 *(12.84)*	1196 *(5.32)*	5.40 *(8.69)*	2499	6.49	1.684 *(6.376)*	0.682 *(0.415)*	10.23 *(2.014)*	176 *(79.7)*	61 *(15.8)*	75 *(23.9)*	28.815 *(97.304)*
MAXIMUM POWER IN SELECTED GEARS											
16.40 *(12.23)*	2596 *(11.55)*	2.37 *(3.81)*	2601	14.90		8th (M4) Gear		172 *(77.5)*	42 *(5.6)*	46 *(7.8)*	29.260 *(98.807)*
17.55 *(13.09)*	1218 *(5.42)*	5.40 *(8.70)*	2500	6.51		10th (H2) Gear		176 *(80.0)*	59 *(15.0)*	75 *(23.9)*	28.820 *(97.321)*

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi *(kPa)*	Two 11.2/10-24; 4; 18 *(125)*	Two 11.2/10-24; 4; 18 *(125)*
Ballast	—Liquid (each)	280 lb *(127 kg)*	None
	—Cast Iron (each)	180 lb *(82 kg)*	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 6-14; 4; 26 *(180)*	Two 6-14; 4; 26 *(180)*
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	55 lb *(25 kg)*	None
Height of Drawbar		14 in *(355 mm)*	14 in *(355 mm)*
Static Weight with Operator	—Rear	2575 lb *(1168 kg)*	1655 lb *(751 kg)*
	—Front	1190 lb *(540 kg)*	1080 lb *(490 kg)*
	—Total	3765 lb *(1708 kg)*	2735 lb *(1241 kg)*

142°F *(60.8°C)*. Four gears were chosen between 15% slip and 10 mph *(16.1 km/h)*.

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1366.**

LOUIS I. LEVITICUS
Engineer-in-Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

Massey-Ferguson MF210-4 Diesel

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Roy G. Arnold, Director

NEBRASKA TRACTOR TEST 1367 — MASSEY-FERGUSON MF220 DIESEL

12 SPEED

POWER TAKE-OFF PERFORMANCE

	Power Hp *(kW)*	Crank shaft speed rpm	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temperature °F *(°C)* Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg *(kPa)*
MAXIMUM POWER AND FUEL CONSUMPTION									
Rated Engine Speed—Two Hours (PTO Speed—580 rpm)									
	26.37 *(19.66)*	2500	2.078 *(7.866)*	0.550 *(0.335)*	12.69 *(2.499)*	175 *(79.7)*	64 *(17.7)*	75 *(23.8)*	28.900 *(97.591)*
Standard Power Take-off Speed (540 rpm)—One Hour									
	25.52 *(19.03)*	2327	1.911 *(7.234)*	0.522 *(0.318)*	13.36 *(2.631)*	175 *(79.6)*	64 *(17.8)*	75 *(23.9)*	28.900 *(97.591)*
VARYING POWER AND FUEL CONSUMPTION—Two Hours									
	23.22 *(17.32)*	2589	1.707 *(6.462)*	0.513 *(0.312)*	13.60 *(2.680)*	173 *(78.3)*	64 *(17.8)*	75 *(23.9)*	....
	0.00 *(0.00)*	2713	0.598 *(2.264)*	....	....	168 *(75.6)*	64 *(17.8)*	76 *(24.4)*	....
	11.87 *(8.85)*	2646	1.088 *(4.119)*	0.639 *(0.389)*	10.91 *(2.149)*	171 *(77.2)*	64 *(17.8)*	75 *(23.9)*	....
	26.33 *(19.63)*	2500	2.073 *(7.847)*	0.549 *(0.334)*	12.70 *(2.502)*	176 *(80.0)*	64 *(17.8)*	75 *(23.9)*	....
	6.02 *(4.49)*	2680	0.856 *(3.240)*	0.993 *(0.604)*	7.03 *(1.386)*	169 *(76.1)*	64 *(17.8)*	76 *(24.2)*	....
	17.67 *(13.18)*	2626	1.365 *(5.160)*	0.538 *(0.327)*	12.96 *(2.554)*	173 *(78.3)*	64 *(17.8)*	75 *(23.9)*	....
Av ***Av***	**14.18** ***(10.57)***	**2625**	**1.281** ***(4.849)***	**0.630** ***(0.383)***	**11.07** ***(2.180)***	**172** ***(77.6)***	**64** ***(17.8)***	**75** ***(24.1)***	**28.873** ***(97.501)***

DRAWBAR PERFORMANCE

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temp. °F *(°C)* Cool-ing med	Air wet bulb	Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power—Two Hours 9th (H1) Gear											
22.73 *(16.95)*	1965 *(8.74)*	4.34 *(6.98)*	2498	8.30	2.025 *(7.665)*	0.622 *(0.378)*	11.22 *(2.211)*	173 *(78.3)*	54 *(11.9)*	64 *(17.5)*	29.025 *(98.013)*
75% of Pull at Maximum Power—Ten Hours 9th (H1) Gear											
19.00 *(14.17)*	1551 *(6.90)*	4.59 *(7.39)*	2593	6.36	1.638 *(6.200)*	0.601 *(0.366)*	11.60 *(2.285)*	172 *(78.0)*	52 *(11.3)*	65 *(18.2)*	29.014 *(97.976)*
50% of Pull at Maximum Power—Two Hours 9th (H1) Gear											
13.12 *(9.78)*	1035 *(4.60)*	4.75 *(7.65)*	2630	4.55	1.290 *(4.884)*	0.686 *(0.417)*	10.17 *(2.003)*	172 *(77.5)*	54 *(12.2)*	68 *(19.7)*	29.010 *(97.962)*
50% of Pull at Reduced Engine Speed—Two Hours 10th (H2) Gear											
13.09 *(9.76)*	1032 *(4.59)*	4.76 *(7.65)*	1863	4.34	1.003 *(3.798)*	0.535 *(0.325)*	13.04 *(2.570)*	168 *(75.6)*	54 *(11.9)*	69 *(20.6)*	29.010 *(97.962)*
MAXIMUM POWER IN SELECTED GEARS											
21.48 *(16.02)*	3287 *(14.62)*	2.45 *(3.94)*	2558	14.95	8th (M4) Gear			172 *(77.8)*	46 *(7.8)*	55 *(12.8)*	28.900 *(97.591)*
23.95 *(17.86)*	2068 *(9.20)*	4.34 *(6.99)*	2500	8.06	9th (H1) Gear			174 *(78.6)*	53 *(11.7)*	58 *(14.4)*	28.970 *(97.827)*
23.75 *(17.71)*	1415 *(6.29)*	6.29 *(10.13)*	2500	5.60	10th (H2) Gear			173 *(78.3)*	52 *(11.1)*	57 *(13.9)*	28.900 *(97.895)*
23.39 *(17.44)*	1051 *(4.67)*	8.35 *(13.44)*	2500	4.21	11th (H3) Gear			174 *(78.9)*	53 *(11.7)*	58 *(14.4)*	29.020 *(97.996)*

LUGGING ABILITY IN 9th (H1) GEAR

Crankshaft Speed rpm	2500	2254	2003	1752	1493	1247
Pull—lbs *(kN)*	2068 *(9.20)*	2150 *(9.56)*	2242 *(9.97)*	2229 *(9.91)*	2226 *(9.90)*	2083 *(9.27)*
Increase in Pull %	0	4	8	8	8	1
Power—Hp *(kW)*	23.95 *(17.86)*	22.37 *(16.68)*	20.61 *(15.37)*	17.91 *(13.36)*	15.27 *(11.38)*	12.01 *(8.95)*
Speed—Mph *(km/h)*	4.34 *(6.99)*	3.90 *(6.28)*	3.45 *(5.55)*	3.01 *(4.85)*	2.57 *(4.14)*	2.16 *(3.48)*
Slip %	8.06	8.59	8.97	9.06	8.87	8.30

Department of Agricultural Engineering

Dates of Test: September 15 to 26, 1980

Manufacturer: TOYOSHA COMPANY LTD, 55 Joshoji-16, Kadoma City, Osaka Japan

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 47.9 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60°** ***(15°/15°)*** 0.8378 **Fuel weight** 6.976 lbs/gal *(0.836 kg/l)* **Oil SAE** 20-20W **API service classification** SB/SE-CA/CC **To motor** 0.953 gal *(3.606 l)* **Drained from motor** 0.735 gal *(2.783 l)* **Transmission and final drive lubricant** Massey Ferguson Permatran fluid **Total time engine was operated** 41.0 hours

ENGINE: Make Toyosha Diesel **Type** two cylinder vertical **Serial No.** S 148 MO 0199 **Crankshaft** lengthwise **Rated rpm** 2500 **Bore and stroke** 3.82″ × 3.94″ *(97 mm × 100 mm)* **Compression ratio** 23 to 1 **Displacement** 90.3 cu in *(1480 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** one paper element **Oil filter** one full flow paper cartridge **Fuel filter** one paper cartridge **Muffler** vertical **Cooling medium temperature control** one thermostat.

CHASSIS: Type standard **Serial No.** 00224 **Tread width** rear 40.9″ *(1040 mm)* to 62.5″ *(1588 mm)* front 40.9″ *(1040 mm)* to 51.2″ *(1300 mm)* **Wheel base** 61.6″ *(1565 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 22.6″ *(574 mm)* Vertical distance above roadway 26.6″ *(676 mm)* Horizontal distance from center of rear wheel tread 0″ *(0 mm)* to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph *(km/h)*** first 0.3 *(0.5)* second 0.4 *(0.6)* third 0.5 *(0.8)* fourth 0.9 *(1.4)* fifth 1.0 *(1.6)* sixth 1.5 *(2.4)* seventh 1.9 *(3.1)* eighth 2.8 *(4.5)* ninth 4.7 *(7.6)* tenth 6.7 *(10.8)* eleventh 8.8 *(14.2)* twelfth 14.0 *(22.5)* reverse 0.6 *(1.0)*, 2.0 *(3.2)*, 9.2 *(14.8)* **Clutch** dry single disc operated by foot pedal **Brakes** drum and shoe operated by two foot pedals which can be locked together **Steering** mechanical **Turning radius** (on concrete surface with brake applied) right 90.3″ *(2.29 m)* left 91.0″ *(2.31 m)* (on concrete surface without brake) right 108.6″ *(2.76 m)* left 106.8″ *(2.71 m)* **Turning space diameter** (on concrete surface with brake applied) right 189″ *(4.80 m)* left 190.5″ *(4.84 m)* (on concrete surface without brake) right 225.8″ *(5.73 m)* left 222″ *(5.64 m)* **Power take-off** 540 rpm at 2327 engine rpm.

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)
Maximum Available Power—Two Hours	93.5
75% of Pull at Maximum Power—Ten Hours	93.5
50% of Pull at Maximum Power—Two Hours	92.0
50% of Pull at Reduced Engine Speed—Two Hours	90.0
Bystander in 12th (H4) gear	79.5

TIRES, BALLAST AND WEIGHT		**With Ballast**	**Without Ballast**
Rear Tires	—No., size, ply & psi *(kPa)*	Two 12.4-24; 4; 16 *(110)*	Two 12.4-24; 4; 16 *(110)*
Ballast	—Liquid (each)	380 lb *(172 kg)*	None
	—Cast Iron (each)	297 lb *(135 kg)*	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 5.00-15; 4; 36 *(250)*	Two 5.00-15; 4; 36 *(250)*
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	50 lb *(23 kg)*	None
Height of Drawbar		14 in *(355 mm)*	14 in *(355 mm)*
Static Weight with Operator	—Rear	3140 lb *(1424 kg)*	1785 lb *(810 kg)*
	—Front	1080 lb *(490 kg)*	980 lb *(444 kg)*
	—Total	4220 lb *(1914 kg)*	2765 lb *(1254 kg)*

procedure. Temperature at injection pump was 138°F *(59.0°C)*. Four gears were chosen between 15% slip and 10 mph *(16.1 km/h)*. Both cylinder walls were found to be scratched during final inspection.

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1367.**

LOUIS I. LEVITICUS
Engineer-in-Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

220
MASSEY FERGUSON

Massey-Ferguson MF220 Diesel

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Roy G. Arnold, Director

NEBRASKA TRACTOR TEST 1368 —MASSEY-FERGUSON MF220-4 DIESEL

12 SPEED

POWER TAKE-OFF PERFORMANCE

	Power Hp *(kW)*	Crank shaft speed rpm	Fuel Consumption gal/hr *(l/h)*	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Fuel Consumption Hp.hr/gal *(kW.h/l)*	Temperature °F *(°C)* Cooling medium	Temperature °F *(°C)* Air wet bulb	Temperature °F *(°C)* Air dry bulb	Barometer inch Hg *(kPa)*
MAXIMUM POWER AND FUEL CONSUMPTION									
Rated Engine Speed—Two Hours (PTO Speed—580 rpm)									
	26.48 *(19.75)*	2500	1.929 *(7.302)*	0.508 *(0.309)*	13.72 *(2.705)*	174 *(78.9)*	59 *(14.9)*	75 *(23.9)*	29.183 *(98.548)*
Standard Power Take-off Speed (540 rpm)—One Hour									
	26.06 *(19.43)*	2326	1.849 *(6.999)*	0.495 *(0.301)*	14.09 *(2.776)*	173 *(78.6)*	58 *(14.5)*	75 *(23.9)*	29.175 *(98.520)*
VARYING POWER AND FUEL CONSUMPTION—Two Hours									
	22.87 *(17.05)*	2541	1.643 *(6.219)*	0.501 *(0.305)*	13.92 *(2.742)*	172 *(77.8)*	58 *(14.4)*	75 *(23.9)*	....
	0.00 *(0.00)*	2687	0.581 *(2.199)*	....	....	164 *(73.3)*	58 *(14.4)*	75 *(23.9)*	....
	11.78 *(8.78)*	2615	1.049 *(3.971)*	0.622 *(0.378)*	11.22 *(2.211)*	169 *(76.1)*	58 *(14.4)*	75 *(23.9)*	......
	26.76 *(19.95)*	2500	1.918 *(7.260)*	0.500 *(0.304)*	13.95 *(2.748)*	174 *(78.6)*	58 *(14.4)*	76 *(24.2)*	....
	5.96 *(4.44)*	2650	0.821 *(3.108)*	0.962 *(0.585)*	7.25 *(1.429)*	166 *(74.4)*	57 *(13.9)*	75 *(23.9)*	....
	17.42 *(12.99)*	2580	1.320 *(4.997)*	0.529 *(0.322)*	13.20 *(2.600)*	170 *(76.7)*	57 *(13.9)*	75 *(23.9)*	....
Av ***Av***	**14.13** ***(10.54)***	**2596**	**1.222** ***(4.626)***	**0.603** ***(0.367)***	**11.56** ***(2.278)***	**169** ***(76.2)***	**58** ***(14.3)***	**75** ***(23.9)***	**29.160** ***(98.469)***

DRAWBAR PERFORMANCE
(Front Wheel Drive Disengaged)

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr *(l/h)*	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Fuel Consumption Hp.hr/gal *(kW.h/l)*	Temp. °F *(°C)* Cool-ing med	Temp. °F *(°C)* Air wet bulb	Temp. °F *(°C)* Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power—Two Hours 9th (H1) Gear											
20.87 *(15.56)*	2031 *(9.03)*	3.85 *(6.20)*	2501	8.10	1.881 *(7.122)*	0.629 *(0.383)*	11.09 *(2.185)*	174 *(78.9)*	55 *(12.8)*	72 *(22.2)*	28.890 *(97.557)*
75% of Pull at Maximum Power—Ten Hours 9th (H1) Gear											
17.96 *(13.39)*	1673 *(7.44)*	4.03 *(6.48)*	2562	6.25	1.555 *(5.888)*	0.604 *(0.367)*	11.55 *(2.275)*	168 *(75.6)*	48 *(8.9)*	60 *(15.7)*	29.032 *(98.037)*
50% of Pull at Maximum Power—Two Hours 9th (H1) Gear											
12.57 *(9.37)*	1123 *(5.00)*	4.20 *(6.75)*	2621	4.43	1.254 *(4.748)*	0.696 *(0.423)*	10.02 *(1.974)*	162 *(72.2)*	39 *(3.9)*	45 *(6.9)*	28.985 *(97.878)*
50% of Pull at Reduced Engine Speed—Two Hours 10th (H2) Gear											
12.55 *(9.36)*	1119 *(4.98)*	4.20 *(6.77)*	1859	4.30	1.021 *(3.866)*	0.568 *(0.345)*	12.28 *(2.420)*	164 *(73.3)*	46 *(7.8)*	57 *(13.6)*	28.865 *(97.473)*
MAXIMUM POWER IN SELECTED GEARS											
21.78 *(16.24)*	3496 *(15.55)*	2.34 *(3.76)*	2511	14.90	8th (M4) Gear			167 *(74.7)*	36 *(2.2)*	40 *(4.4)*	29.020 *(97.996)*
22.91 *(17.09)*	2235 *(9.94)*	3.84 *(6.19)*	2499	8.24	9th (H1) Gear			174 *(78.6)*	55 *(12.8)*	66 *(18.9)*	28.820 *(97.321)*
22.82 *(17.02)*	1529 *(6.80)*	5.60 *(9.01)*	2501	5.30	10th (H2) Gear			173 *(78.1)*	56 *(13.3)*	69 *(20.6)*	28.870 *(97.490)*
22.18 *(16.54)*	1121 *(4.99)*	7.42 *(11.94)*	2499	3.97	11th (H3) Gear			173 *(78.3)*	56 *(13.3)*	69 *(20.6)*	28.870 *(97.490)*

LUGGING ABILITY IN 9th (H1) GEAR

Crankshaft Speed rpm	2499	2254	1998	1738	1496	1244
Pull—lbs *(kN)*	2235 *(9.94)*	2334 *(10.38)*	2413 *(10.73)*	2444 *(10.87)*	2438 *(10.84)*	2289 *(10.18)*
Increase in Pull %	0	4	8	9	9	2
Power—Hp *(kW)*	22.91 *(17.09)*	21.45 *(15.99)*	19.57 *(14.60)*	17.22 *(12.84)*	14.97 *(11.03)*	11.62 *(8.66)*
Speed—Mph *(km/h)*	3.84 *(6.19)*	3.45 *(5.55)*	3.04 *(4.90)*	2.64 *(4.25)*	2.28 *(3.66)*	1.90 *(3.06)*
Slip %	8.24	8.86	9.23	9.42	9.32	8.67

Department of Agricultural Engineering

Dates of Test: September 18 to October 7, 1980

Manufacturer: TOYOSHA COMPANY LTD, 55 Joshoji-16, Kadoma City, Osaka Japan

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 47.9 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60°** *(15°/15°)* 0.8378 **Fuel weight** 6.976 lbs/gal *(0.836 kg/l)* **Oil SAE** 20-20W **API service classification** SB/SE-CA/CC **To motor** 1.111 gal *(4.206 l)* **Drained from motor** 0.955 gal *(3.614 l)* **Transmission and final drive lubricant** Massey Ferguson Permatran fluid **Total time engine was operated** 39.0 hours

ENGINE: Make Toyosha Diesel **Type** two cylinder vertical **Serial No.** S 148 MO 1294 **Crankshaft** lengthwise **Rated rpm** 2500 **Bore and stroke** 3.82″ × 3.94″ *(97 mm × 100 mm)* **Compression ratio** 23 to 1 **Displacement** 90.3 cu in *(1480 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** one paper element **Oil filter** one full flow paper cartridge **Fuel filter** one paper cartridge **Muffler** vertical **Cooling medium temperature control** one thermostat

CHASSIS: Type front wheel assist **Serial No.** 00624 **Tread width** rear 40.9″ *(1040 mm)* to 62.5″ *(1588 mm)* front 44.9″ *(1140 mm)* **Wheel base** 62.6″ *(1590 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 26.0″ *(660 mm)* Vertical distance above roadway 28.1″ *(714 mm)* Horizontal distance from center of rear wheel tread 0″ *(0 mm)* to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph *(km/h)*** first 0.3 *(0.5)* second 0.4 *(0.6)* third 0.6 *(1.0)* fourth 0.9 *(1.4)* fifth 1.0 *(1.6)* sixth 1.4 *(2.3)* seventh 1.9 *(3.1)* eighth 2.8 *(4.5)* ninth 4.2 *(6.8)* tenth 6.0 *(9.7)* eleventh 7.8 *(12.6)* twelfth 11.6 *(18.7)* reverse 0.6 *(1.0)*, 2.0 *(3.2)*, 8.2 *(13.2)* **Clutch** dry disc operated by foot pedal **Brakes** drum and shoe operated by two foot pedals which can be locked together **Steering** mechanical **Turning radius** (on concrete surface with brake applied) right 93.9″ *(2.38 m)* left 94.0″ *(2.39 m)* (on concrete surface without brake) right 111.3″ *(2.83 m)* left 112.6″ *(2.86 m)* **Turning space diameter** (on concrete surface with brake applied) right 203.8″ *(5.18 m)* left 204″ *(5.18 m)* (on concrete surface without brake) right 237.5″ *(6.03 m)* left 240.3″ *(6.10 m)* **Power take-off** 540 rpm at 2326 engine rpm.

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump was

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)	Front Wheel Drive Disengaged dB(A)
Maximum Available Power—Two Hours	92.5	92.5
75% of Pull at Maximum Power—Ten Hours		91.5
50% of Pull at Maximum Power—Two Hours		93.0
50% of Pull at Reduced Engine Speed—Two Hours		89.5
Bystander in 12th (H4) gear		79.0

DRAWBAR PERFORMANCE
(Front Wheel Drive Engaged)

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr *(l/h)*	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Fuel Consumption Hp.hr/gal *(kW.h/l)*	Temp. °F *(°C)* Cool-ing med	Temp. °F *(°C)* Air wet bulb	Temp. °F *(°C)* Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power—Two Hours 9th (H1) Gear											
21.45 *(16.00)*	2018 *(8.98)*	3.99 *(6.42)*	2500	6.78	1.935 *(7.326)*	0.629 *(0.383)*	11.09 *(2.184)*	175 *(79.2)*	54 *(11.9)*	72 *(22.2)*	28.900 *(97.591)*
MAXIMUM POWER IN SELECTED GEARS											
17.48 *(13.03)*	3973 *(17.67)*	1.65 *(2.65)*	2577	14.91	7th (M3) Gear			162 *(72.2)*	35 *(1.7)*	37 *(2.8)*	29.040 *(98.064)*
22.52 *(16.79)*	2117 *(9.42)*	3.99 *(6.42)*	2499	6.68	9th (H1) Gear			173 *(78.3)*	56 *(13.3)*	68 *(20.0)*	28.870 *(97.490)*

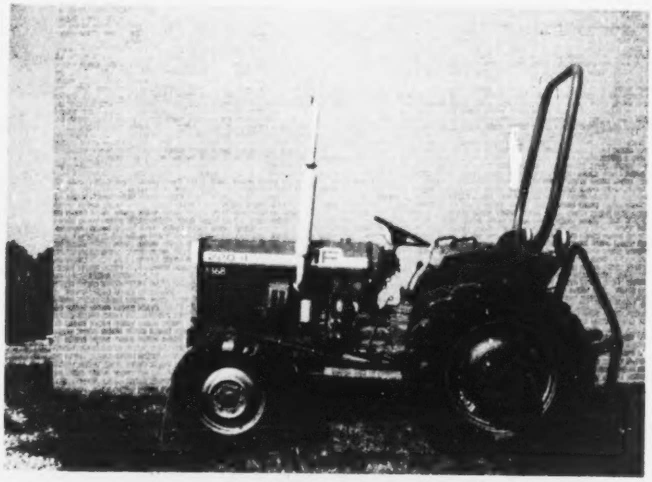
TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi *(kPa)*	Two 12.4-24; 4; 16 *(110)*	Two 12.4-24; 4; 16 *(110)*
Ballast	—Liquid (each)	380 lb *(172 kg)*	None
	—Cast Iron (each)	224 lb *(101 kg)*	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 7-16; 4; 26 *(180)*	Two 7-16; 4; 26 *(180)*
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	50 lb *(23 kg)*	None
Height of Drawbar		14 in *(355 mm)*	14 in *(355 mm)*
Static Weight with Operator	—Rear	3112 lb *(1411 kg)*	1905 lb *(864 kg)*
	—Front	1375 lb *(624 kg)*	1275 lb *(578 kg)*
	—Total	4487 lb *(2035 kg)*	3180 lb *(1442 kg)*

136°F *(57.6°C)*. Four gears were chosen between 15% slip and 10 mph *(16.1 km/h)*.

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1368.**

LOUIS I. LEVITICUS
Engineer-in-Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers



Massey-Ferguson MF220-4 Diesel

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Roy G. Arnold, Director

NEBRASKA TRACTOR TEST 1369 — KUBOTA M5500 DT DIESEL
ALSO KUBOTA M5500 DIESEL
16 SPEED

POWER TAKE-OFF PERFORMANCE

	Power Hp *(kW)*	Crank shaft speed rpm	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temperature °F (°C) Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg *(kPa)*
MAXIMUM POWER AND FUEL CONSUMPTION									
Rated Engine Speed—Two Hours (PTO Speed—643 rpm)									
	53.99 *(40.26)*	2400	3.516 *(13.310)*	0.454 *(0.276)*	15.35 *(3.025)*	200 *(93.3)*	58 *(14.6)*	75 *(23.8)*	28.803 *(97.265)*
Standard Power Take-off Speed (540 rpm)—One Hour									
	49.18 *(36.67)*	2015	3.032 *(11.477)*	0.430 *(0.262)*	16.22 *(3.195)*	201 *(93.7)*	58 *(14.3)*	75 *(23.9)*	28.830 *(97.355)*
VARYING POWER AND FUEL CONSUMPTION—Two Hours									
	47.57 *(35.47)*	2488	3.126 *(11.833)*	0.459 *(0.279)*	15.21 *(2.998)*	190 *(87.5)*	58 *(14.4)*	76 *(24.4)*	....
	0.00 *(0.00)*	2578	1.333 *(5.046)*	....	....	180 *(81.9)*	58 *(14.4)*	75 *(23.6)*	....
	24.36 *(18.17)*	2548	1.983 *(7.506)*	0.568 *(0.345)*	12.29 *(2.421)*	186 *(85.3)*	59 *(14.7)*	75 *(23.9)*	......
	54.72 *(40.80)*	2400	3.544 *(13.416)*	0.452 *(0.275)*	15.44 *(3.041)*	195 *(90.3)*	59 *(14.7)*	75 *(23.9)*	....
	12.26 *(9.14)*	2566	1.595 *(6.038)*	0.908 *(0.552)*	7.68 *(1.514)*	180 *(81.9)*	59 *(15.0)*	76 *(24.4)*	....
	36.19 *(26.99)*	2524	2.494 *(9.441)*	0.481 *(0.293)*	14.51 *(2.859)*	[illegible] *(85.8)*	59 *(15.0)*	77 *(25.0)*	....
Av ***Av***	**29.18** ***(21.76)***	**2517**	**2.346** ***(8.881)***	**0.561** ***(0.341)***	**12.44** ***(2.450)***	**186** ***(85.4)***	**59** ***(14.7)***	**76** ***(24.2)***	**28.845** ***(97.405)***

DRAWBAR PERFORMANCE
(Front Wheel Drive Disengaged)

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temp. °F (°C) Cool-ing med	Air wet bulb	Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power—Two Hours 13th (HH1) Gear											
45.12 *(33.65)*	3068 *(13.65)*	5.52 *(8.88)*	2400	6.18	3.458 *(13.091)*	0.535 *(0.325)*	13.05 *(2.570)*	196 *(90.8)*	60 *(15.3)*	83 *(28.1)*	28.810 *(97.287)*
75% of Pull at Maximum Power—Ten Hours 13th (HH1) Gear											
37.66 *(28.08)*	2401 *(10.68)*	5.88 *(9.47)*	2511	4.31	2.949 *(11.165)*	0.546 *(0.332)*	12.77 *(2.515)*	184 *(84.7)*	48 *(8.6)*	64 *(17.8)*	29.040 *(98.064)*
50% of Pull at Maximum Power—Two Hours 13th (HH1) Gear											
25.75 *(19.20)*	1602 *(7.12)*	6.03 *(9.70)*	2540	3.01	2.329 *(8.818)*	0.631 *(0.384)*	11.05 *(2.177)*	179 *(81.7)*	47 *(8.1)*	59 *(15.0)*	29.155 *(98.452)*
50% of Pull at Reduced Engine Speed—Two Hours 14th (HH2) Gear											
25.82 *(19.25)*	1601 *(7.12)*	6.05 *(9.73)*	2090	2.91	2.007 *(7.597)*	0.542 *(0.330)*	12.87 *(2.534)*	179 *(81.4)*	48 *(8.6)*	63 *(16.9)*	29.110 *(98.300)*
MAXIMUM POWER IN SELECTED GEARS											
41.45 *(30.91)*	6287 *(27.97)*	2.47 *(3.98)*	2469	14.92		10th (LH4) Gear		182 *(83.3)*	41 *(5.0)*	49 *(9.4)*	29.140 *(98.401)*
44.08 *(32.87)*	5883 *(26.17)*	2.81 *(4.52)*	2400	12.76		11th (HL3) Gear		185 *(85.0)*	45 *(7.2)*	56 *(13.3)*	29.160 *(98.469)*
45.50 *(33.93)*	4242 *(18.87)*	4.02 *(6.47)*	2402	8.55		12th (HL4) Gear		189 *(87.2)*	58 *(14.4)*	76 *(24.4)*	28.840 *(97.388)*
46.96 *(35.02)*	3197 *(14.22)*	5.51 *(8.87)*	2400	6.29		13th (HH1) Gear		186 *(85.6)*	53 *(11.7)*	65 *(18.3)*	28.860 *(97.456)*
46.38 *(34.58)*	2559 *(11.38)*	6.80 *(10.94)*	2401	4.97		14th (HH2) Gear		191 *(88.1)*	58 *(14.4)*	78 *(25.6)*	28.840 *(97.388)*

LUGGING ABILITY IN 13th (HH1) GEAR

Crankshaft Speed rpm	2400	2159	1911	1679	1442	1189	953
Pull—lbs *(kN)*	3197 *(14.22)*	3387 *(15.07)*	3511 *(15.62)*	3623 *(16.12)*	3782 *(16.82)*	3865 *(17.19)*	3784 *16.83)*
Increase in Pull %	0	6	10	13	18	21	18
Power—Hp *(kW)*	46.96 *(35.02)*	44.58 *(33.24)*	40.76 *(30.39)*	36.81 *(27.45)*	32.84 *(24.49)*	27.63 *(20.61)*	21.72 *(16.20)*
Speed—Mph *(km/h)*	5.51 *(8.87)*	4.94 *(7.94)*	4.35 *(7.01)*	3.81 *(6.13)*	3.26 *(5.24)*	2.68 *(4.31)*	2.15 *(3.46)*
Slip %	6.29	6.59	7.06	7.29	7.64	7.87	7.75

Department of Agricultural Engineering

Dates of Test: October 4-16, 1980

Manufacturer: KUBOTA, LTD., 2-47 Shikitsu-Higashi 1-chome Naniwa-ku, Osaka Japan

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 47.9 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60°** ***(15°/15°)*** 0.8378 **Fuel weight** 6.976 lbs/gal *(0.836 kg/l)* **Oil SAE** 20-20W **API service classification** SB/SE-CA/CD **To motor** 2.262 gal *(8.564 l)* **Drained from motor** 2.124 gal *(8.041 l)* **Transmission and final drive lubricant** SAE 80 or tractor hydraulic fluid **Front axle lubricant** SAE 80/90 **Total time engine was operated** 40.0 hours

ENGINE: Make Kubota Diesel **Type** three cylinder vertical **Serial No.** D3000-A-5549 **Crankshaft** lengthwise **Rated rpm** 2400 **Bore and stroke** 4.134" × 4.528" *(105 mm × 115 mm)* **Compression ratio** 17.0 to 1 **Displacement** 182 cu in *(2987 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** one paper element **Oil filter** one full flow paper cartridge **Fuel filter** two paper elements **Muffler** vertical **Cooling medium temperature control** one thermostat

CHASSIS: Type front wheel assist **Serial No.** M5500DT-10503 **Tread width** rear 51.2" *(1300 mm)* to 74.8" *(1900 mm)* front 57.1" *(1450 mm)* **Wheel base** 80.9" *(2055 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 36.5" *(928 mm)* Vertical distance above roadway 36.4" *(925 mm)* Horizontal distance from center of rear wheel tread 0" *(0 mm)* to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph** ***(km/h)*** first 0.3 *(0.4)* second 0.3 *(0.5)* third 0.6 *(0.9)* fourth 0.8 *(1.2)* fifth 1.0 *(1.6)* sixth 1.2 *(2.0)* seventh 1.7 *(2.7)* eighth 2.0 *(3.3)* ninth 2.1 *(3.4)* tenth 2.7 *(4.4)* eleventh 3.4 *(5.5)* twelfth 4.7 *(7.5)* thirteenth 6.2 *(10.0)* fourteenth 7.6 *(12.2)* fifteenth 12.8 *(20.5)* sixteenth 17.4 *(28.0)* reverse 0.4 *(0.6)*, 1.4 *(2.3)*, 2.2 *(3.5)*, 8.2 *(13.2)* **Clutch** dry single disc operated by foot pedal **Brakes** wet multiple disc operated by two foot pedals which can be locked together and hand lever **Steering** power assist **Turning radius** (on concrete surface with brake applied) right 135.8" *(3..45 m)* left 135.8" *(3.45 m)* (on concrete surface without brake) right 161.4" *(4.10 m)* left 161.4" *(4.10 m)* **Turning space diameter** (on concrete surface with brake applied) right 271.7" *(6.90 m)* left 272.4" *(6.92 m)* (on concrete surface without brake) right 322.8" *(8.20 m)* left 322.8" *(8.20 m)* **Power take-off** 540 rpm at 2015 engine rpm.

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)	Front Wheel Drive Disengaged dB(A)
Maximum Available Power—Two Hours	94.5	94.0
75% of Pull at Maximum Power—Ten Hours		94.0
50% of Pull at Maximum Power—Two Hours		93.0
50% of Pull at Reduced Engine Speed—Two Hours		90.5
Bystander in 16th (HH4) gear		83.5

DRAWBAR PERFORMANCE (Front Wheel Drive Engaged)

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr *(l/h)*	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Fuel Consumption Hp.hr/gal *(kW.h/l)*	Temp. °F (°C) Cooling med	Temp. °F (°C) Air wet bulb	Temp. °F (°C) Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power—Two Hours 13th (HH1) Gear											
44.06 *(32.86)*	2885 *(12.84)*	5.73 *(9.22)*	2400	4.51	3.422 *(12.955)*	0.542 *(0.330)*	12.87 *(2.536)*	199 *(92.5)*	61 *(16.1)*	87 *(30.3)*	28.785 *(97.203)*
MAXIMUM POWER IN SELECTED GEARS											
35.76 *(26.66)*	7751 *(34.48)*	1.73 *(2.78)*	2501	14.96	8th (HL2) Gear			179 *(81.7)*	38 *(3.3)*	46 *(7.8)*	29.130 *(98.368)*
45.81 *(34.16)*	3007 *(13.38)*	5.71 *(9.19)*	2399	4.60	13th (HH1) Gear			188 *(86.7)*	55 *(12.8)*	71 *(21.7)*	28.850 *(97.422)*

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi *(kPa)*	Two 16.9-28; 6; 18 *(125)*	Two 16.9-28; 6; 18 *(125)*
Ballast	—Liquid (each)	700 lb *(318 kg)*	None
	—Cast Iron (each)	470 lb *(213 kg)*	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 9.5-24; 6; 20 *(140)*	Two 9.5-24; 6; 20 *(140)*
Ballast	—Liquid (each)	180 lb *(81 kg)*	None
	—Cast Iron (each)	255 lb *(116 kg)*	None
Height of Drawbar		19.5 in *(495 mm)*	19.5 in *(495 mm)*
Static Weight with Operator	—Rear	5550 lb *(2518 kg)*	3210 lb *(1456 kg)*
	—Front	3160 lb *(1433 kg)*	2290 lb *(1039 kg)*
	—Total	8710 lb *(3951 kg)*	5500 lb *(2495 kg)*

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump was 157°F *(69.3°C)*. Five gears were chosen between 15% slip and 10 mph *(16.1 km/h)*. This tractor did not meet manufacturer's claim of 55.3 HP *(41.25 kw)* PTO power.

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1369**.

LOUIS I. LEVITICUS
Engineer-in-Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

Kubota M5500 DT Diesel

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska-Lincoln
Roy G. Arnold, Director

NEBRASKA TRACTOR TEST 1370 — KUBOTA L295 DT DIESEL
ALSO KUBOTA L295 DIESEL
8 SPEED

POWER TAKE-OFF PERFORMANCE

MAXIMUM POWER AND FUEL CONSUMPTION

Rated Engine Speed—Two Hours (PTO Speed—622 rpm)

Power Hp (kW)	Crank shaft speed rpm	Fuel Consumption gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temperature °F (°C) Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg (kPa)
26.46 (19.73)	2800	1.891 (7.158)	0.499 (0.303)	13.99 (2.756)	224 (106.7)	59 (14.9)	75 (23.9)	28.857 (97.445)

Standard Power Take-off Speed (540 rpm)—One Hour

Power Hp (kW)	Crank shaft speed rpm	Fuel Consumption gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temperature °F (°C) Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg (kPa)
24.91 (18.58)	2430	1.707 (6.462)	0.478 (0.291)	14.59 (2.875)	222 (105.7)	59 (14.8)	75 (24.1)	28.840 (97.388)

VARYING POWER AND FUEL CONSUMPTION—Two Hours

Power Hp (kW)	Crank shaft speed rpm	Fuel Consumption gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temperature °F (°C) Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg (kPa)
22.95 (17.11)	2854	1.617 (6.121)	0.492 (0.299)	14.19 (2.795)	200 (93.3)	60 (15.3)	77 (25.0)	....
0.00 (0.00)	3028	0.546 (2.067)	....	....	184 (84.4)	60 (15.6)	79 (25.8)	....
11.79 (8.79)	2935	1.036 (3.922)	0.613 (0.373)	11.38 (2.241)	189 (86.9)	60 (15.6)	79 (26.1)	......
26.64 (19.87)	2802	1.927 (7.294)	0.504 (0.307)	13.83 (2.724)	216 (101.9)	61 (15.8)	80 (26.4)	....
5.95 (4.44)	2964	0.770 (2.915)	0.903 (0.549)	7.73 (1.523)	185 (85.0)	61 (16.1)	81 (27.2)	....
17.52 (13.06)	2906	1.325 (5.016)	0.528 (0.321)	13.22 (2.604)	191 (88.3)	62 (16.7)	81 (27.2)	....
Av 14.14 ***Av (10.54)***	**2915**	**1.203** ***(4.554)***	**0.594** ***(0.361)***	**11.75** ***(2.314)***	**194** ***(90.0)***	**61** ***(15.8)***	**79** ***(26.3)***	**28.827** ***(97.343)***

DRAWBAR PERFORMANCE
(Front Wheel Drive Disengaged)

Maximum Available Power—Two Hours 6th (H2) Gear

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temp. °F (°C) Cooling med	Air wet bulb	Air dry bulb	Barom. inch Hg (kPa)
21.56 (16.08)	1860 (8.27)	4.35 (6.99)	2800	8.34	1.864 (7.054)	0.603 (0.367)	11.57 (2.279)	198 (91.9)	54 (12.2)	69 (20.6)	28.820 (97.321)

75% of Pull at Maximum Power—Ten Hours 6th (H2) Gear

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temp. °F (°C) Cooling med	Air wet bulb	Air dry bulb	Barom. inch Hg (kPa)
18.16 (13.54)	1480 (6.58)	4.60 (7.41)	2908	6.55	1.595 (6.037)	0.613 (0.373)	11.39 (2.243)	189 (87.3)	52 (10.9)	53 (11.9)	28.753 (97.095)

50% of Pull at Maximum Power—Two Hours 6th (H2) Gear

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temp. °F (°C) Cooling med	Air wet bulb	Air dry bulb	Barom. inch Hg (kPa)
12.53 (9.34)	991 (4.41)	4.74 (7.63)	2940	4.84	1.308 (4.952)	0.728 (0.443)	9.58 (1.887)	187 (85.8)	60 (15.3)	62 (16.4)	28.430 (96.004)

50% of Pull at Reduced Engine Speed—Two Hours-7th (H3) Gear

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temp. °F (°C) Cooling med	Air wet bulb	Air dry bulb	Barom. inch Hg (kPa)
12.63 (9.42)	994 (4.42)	4.77 (7.67)	2050	4.42	1.057 (4.002)	0.584 (0.355)	11.95 (2.353)	187 (86.1)	63 (17.2)	69 (20.6)	28.360 (95.767)

MAXIMUM POWER IN SELECTED GEARS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temp. °F (°C) Cooling med	Air wet bulb	Air dry bulb	Barom. inch Hg (kPa)
21.29 (15.87)	3155 (14.03)	2.53 (4.07)	2829	14.98		4th (L4) Gear		198 (91.9)	52 (11.1)	65 (18.3)	28.840 (97.388)
22.02 (16.42)	2547 (11.33)	3.24 (5.22)	2799	11.05		5th (H1) Gear		198 (91.9)	50 (10.0)	62 (16.7)	28.860 (97.456)
22.82 (17.02)	1969 (8.76)	4.34 (6.99)	2800	8.48		6th (H2) Gear		191 (88.1)	46 (7.8)	54 (12.2)	28.840 (97.388)
21.93 (16.36)	1281 (5.70)	6.42 (10.33)	2800	5.71		7th (H3) Gear		194 (90.0)	51 (10.6)	63 (17.2)	28.850 (97.422)

LUGGING ABILITY IN 6th (H2) GEAR

Crankshaft Speed rpm	2800	2529	2236	1956	1676	1393	1112
Pull—lbs (kN)	1969 (8.76)	2087 (9.28)	2216 (9.86)	2245 (9.99)	2314 (10.29)	2338 (10.40)	2171 (9.66)
Increase in Pull %	0	6	13	14	18	19	10
Power—Hp (kW)	22.82 (17.02)	21.70 (16.18)	20.23 (15.09)	17.91 (13.35)	15.75 (11.75)	13.21 (9.85)	9.87 (7.36)
Speed—Mph (km/h)	4.34 (6.99)	3.90 (6.28)	3.42 (5.51)	2.99 (4.81)	2.55 (4.11)	2.12 (3.41)	1.71 (2.75)
Slip %	8.48	8.99	9.62	9.81	10.16	10.25	9.44

Department of Agricultural Engineering

Dates of Test: October 7-17, 1980

Manufacturer: KUBOTA, LTD., 2-47 Shikitsu-Higashi 1-chome Naniwa-ku, Osaka Japan

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 47.9 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60° *(15°/15°)*** 0.8378 **Fuel weight** 6.976 lbs/gal *(0.836 kg/l)* **Oil SAE** 20-20W **API service classification** SB/SE-CA/CD **To motor** 1.465 gal *(5.546 l)* **Drained from motor** 1.355 gal *(5.129 l)* **Transmission and final drive lubricant** SAE 80 or tractor hydraulic fluid **Front axle lubricant** SAE 90 **Total time engine was operated** 44.0 hours

ENGINE: Make Kubota Diesel **Type** three cylinder vertical **Serial No.** D1301-A-05606 **Crankshaft** lengthwise **Rated rpm** 2800 **Bore and stroke** 3.23" × 3.23" *(82 mm × 82 mm)* **Compression ratio** 21 to 1 **Displacement** 79.3 cu in *(1299 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** one paper element **Oil filter** one full flow paper cartridge **Fuel filter** one paper cartridge **Muffler** horizontal **Cooling medium temperature control** one thermostat

CHASSIS: Type front wheel assist **Serial No.** L295DT-13670 **Tread width** rear 44.1" *(1120 mm)* to 58.7" *(1490 mm)* front 43.3" *(1100 mm)* **Wheel base** 65.4" *(1660 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 30.5" *(774 mm)* Vertical distance above roadway 31.7" *(805 mm)* Horizontal distance from center of rear wheel tread 0" *(0 mm)* to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph *(km/h)*** first 0.9 *(1.4)* second 1.1 *(1.8)* third 1.6 *(2.6)* fourth 3.0 *(4.9)* fifth 3.8 *(6.0)* sixth 4.9 *(7.8)* seventh 7.0 *(11.3)* eighth 13.1 *(21.0)* reverse 1.5 *(2.4)*, 6.4 *(10.3)* **Clutch** dry single disc operated by foot pedal **Brakes** wet disc operated by two foot pedals which can be locked together **Steering** mechanical **Turning radius** (on concrete surface with brake applied) right 98.3" *(2.50 m)* left 98.3" *(2.50 m)* (on concrete surface without brake) right 130" *(3.30 m)* left 130" *(3.30 m)* **Turning space diameter** (on concrete surface with brake applied) right 201" *(5.10 m)* left 201" *(5.10 m)* (on concrete surface without brake) right 264" *(6.70 m)* left 264" *(6.70 m)* **Power take-off** 540 rpm at 2430 engine rpm.

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump was 150°F *(65.8°C)*. Four gears were chosen between 15% slip and 10 mph *(16.1 km/h)*.

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)	Front Wheel Drive Disengaged dB(A)
Maximum Available Power—Two Hours	94.5	95.5
75% of Pull at Maximum Power—Ten Hours		94.0
50% of Pull at Maximum Power—Two Hours		91.5
50% of Pull at Reduced Engine Speed—Two Hours		89.5
Bystander in 8th (H4) gear		81.5

DRAWBAR PERFORMANCE
(Front Wheel Drive Engaged)

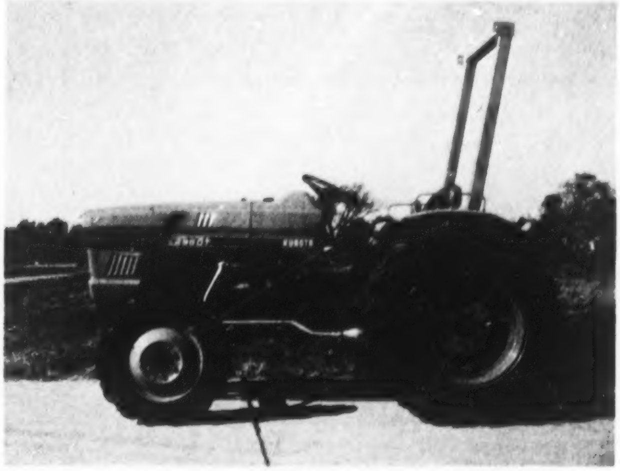
Power Hp (*kW*)	Drawbar pull lbs (*kN*)	Speed mph (*km/h*)	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr (*l/h*)	Fuel Consumption lb/hp.hr (*kg/kW.h*)	Fuel Consumption Hp.hr/gal (*kW.h/l*)	Temp. °F (°C) Cool-ing med	Temp. °F (°C) Air wet bulb	Temp. °F (°C) Air dry bulb	Barom. inch Hg (*kPa*)
Maximum Available Power—Two Hours 6th (H2) Gear											
21.09 *(15.73)*	1754 *(7.80)*	4.51 *(7.26)*	2800	6.67	1.828 *(6.919)*	0.604 *(0.368)*	11.54 *(2.273)*	203 *(94.7)*	56 *(13.1)*	73 *(22.8)*	28.800 *(97.253)*
MAXIMUM POWER IN SELECTED GEARS											
13.33 *(9.94)*	3484 *(15.50)*	1.43 *(2.31)*	2938	14.85		3rd (L3) Gear		187 *(85.8)*	44 *(6.7)*	51 *(10.6)*	28.830 *(97.355)*
22.76 *(16.97)*	1894 *(8.43)*	4.50 *(7.25)*	2800	6.75		6th (H2) Gear		192 *(88.9)*	49 *(9.4)*	59 *(15.0)*	28.860 *(97.456)*

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi (*kPa*)	Two 12.4-24; 6; 16 (*110*)	Two 12.4-24; 6; 16 (*110*)
Ballast	—Liquid (each)	312 lb (*142 kg*)	None
	—Cast Iron (each)	480 lb (*218 kg*)	None
Front Tires	—No., size, ply & psi (*kPa*)	Two 7-16; 4; 26 (*180*)	Two 7-16; 4; 26 (*180*)
Ballast	—Liquid (each)	42 lb (*19 kg*)	None
	—Cast Iron (each)	68 lb (*31 kg*)	None
Height of Drawbar		18.5 in (*470 mm*)	18.5 in (*470 mm*)
Static Weight with Operator	—Rear	3270 lb (*1483 kg*)	1685 lb (*764 kg*)
	—Front	1430 lb (*649 kg*)	1210 lb (*549 kg*)
	—Total	4700 lb (*2132 kg*)	2895 lb (*1313 kg*)

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1370.**

LOUIS I. LEVITICUS
Engineer-in-Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers



Kubota L295 DT Diesel

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Roy G. Arnold, Director

NEBRASKA TRACTOR TEST 1371 — KUBOTA L305 DT DIESEL
ALSO KUBOTA L305 DIESEL
8 SPEED

POWER TAKE-OFF PERFORMANCE

Power Hp *(kW)*	Crank shaft speed rpm	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temperature °F (°C) Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg *(kPa)*
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—597 rpm)								
26.21 *(19.54)*	2800	1.979 *(7.491)*	0.527 *(0.320)*	13.24 *(2.608)*	215 *(101.6)*	58 *(14.2)*	75 *(23.8)*	28.830 *(97.355)*
Standard Power Take-off Speed (540 rpm)—One Hour								
25.14 *(18.75)*	2534	1.818 *(6.882)*	0.504 *(0.307)*	13.83 *(2.724)*	214 *(101.2)*	58 *(14.4)*	75 *(23.7)*	28.845 *(97.405)*
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
22.74 *(16.96)*	2858	1.677 *(6.348)*	0.515 *(0.313)*	13.56 *(2.672)*	202 *(94.2)*	58 *(14.4)*	75 *(23.9)*	....
0.00 *(0.00)*	3034	0.598 *(2.264)*	....	....	184 *(84.2)*	58 *(14.4)*	75 *(23.9)*	....
11.77 *(8.78)*	2960	1.088 *(4.119)*	0.645 *(0.392)*	10.82 *(2.132)*	189 *(87.2)*	58 *(14.4)*	75 *(23.9)*	......
26.36 *(19.66)*	2800	1.995 *(7.552)*	0.528 *(0.321)*	13.21 *(2.603)*	212 *(99.7)*	58 *(14.4)*	75 *(23.6)*	....
5.98 *(4.46)*	3003	0.839 *(3.176)*	0.978 *(0.595)*	7.14 *(1.404)*	185 *(85.0)*	59 *(15.0)*	75 *(23.9)*	....
17.49 *(13.04)*	2930	1.376 *(5.209)*	0.549 *(0.334)*	12.71 *(2.503)*	191 *(88.3)*	59 *(15.0)*	75 *(23.6)*	....
Av 14.06 ***Av (10.48)***	**2931**	**1.262** ***(4.777)***	**0.626** ***(0.381)***	**11.14** ***(2.194)***	**194** ***(89.8)***	**58** ***(14.6)***	**75** ***(23.8)***	**28.837** ***(97.377)***

DRAWBAR PERFORMANCE
(Front Wheel Drive Disengaged)

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temp. °F (°C) Cooling med	Air wet bulb	Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power—Two Hours 6th (H2) Gear											
21.78 *(16.24)*	1956 *(8.70)*	4.17 *(6.72)*	2799	6.61	1.953 *(7.393)*	0.626 *(0.381)*	11.15 *(2.196)*	203 *(94.7)*	56 *(13.3)*	69 *(20.6)*	28.910 *(97.625)*
75% of Pull at Maximum Power—Ten Hours 6th (H2) Gear											
18.27 *(13.62)*	1555 *(6.92)*	4.40 *(7.09)*	2898	4.85	1.641 *(6.213)*	0.627 *(0.381)*	11.13 *(2.192)*	192 *(88.7)*	53 *(11.8)*	67 *(19.4)*	28.812 *(97.297)*
50% of Pull at Maximum Power—Two Hours 6th (H2) Gear											
12.54 *(9.35)*	1034 *(4.60)*	4.55 *(7.32)*	2952	3.50	1.326 *(5.019)*	0.738 *(0.449)*	9.46 *(1.863)*	185 *(85.0)*	47 *(8.3)*	48 *(8.9)*	29.005 *(97.946)*
50% of Pull at Reduced Engine Speed—Two Hours 7th (H3) Gear											
12.60 *(9.40)*	1036 *(4.61)*	4.56 *(7.34)*	2060	3.40	1.111 *(4.205)*	0.615 *(0.374)*	11.35 *(2.235)*	185 *(85.0)*	46 *(7.5)*	48 *(8.9)*	29.030 *(98.030)*
MAXIMUM POWER IN SELECTED GEARS											
13.92 *(10.38)*	3918 *(17.43)*	1.33 *(2.14)*	2945	14.89		3rd (L3) Gear		187 *(85.8)*	44 *(6.7)*	46 *(7.8)*	28.950 *(97.760)*
22.10 *(16.48)*	3401 *(15.13)*	2.44 *(3.92)*	2801	12.25		4th (L4) Gear		194 *(89.7)*	48 *(8.9)*	54 *(12.2)*	28.950 *(97.760)*
22.90 *(17.08)*	2750 *(12.23)*	3.12 *(5.03)*	2801	9.26		5th (H1) Gear		193 *(89.2)*	52 *(11.1)*	62 *(16.7)*	28.940 *(97.726)*
22.96 *(17.12)*	2068 *(9.20)*	4.16 *(6.70)*	2800	6.95		6th (H2) Gear		192 *(88.6)*	50 *(10.0)*	58 *(14.4)*	28.960 *(97.794)*
22.47 *(16.75)*	1372 *(6.10)*	6.14 *(9.88)*	2801	4.37		7th (H3) Gear		193 *(89.4)*	54 *(12.2)*	65 *(18.3)*	28.930 *(97.692)*

LUGGING ABILITY IN 6th (H2) GEAR

Crankshaft Speed rpm	2800	2519	2231	1943	1662	1396	1105
Pull—lbs *(kN)*	2068 *(9.20)*	2216 *(9.86)*	2302 *(10.24)*	2343 *(10.42)*	2395 *(10.65)*	2419 *(10.76)*	2283 *(10.15)*
Increase in Pull %	0	7	11	13	16	17	10
Power—Hp *(kW)*	22.96 *(17.12)*	22.01 *(16.41)*	20.18 *(15.05)*	17.88 *(13.33)*	15.59 *(11.63)*	13.21 *(9.85)*	9.95 *(7.42)*
Speed—Mph *(km/h)*	4.16 *(6.70)*	3.73 *(6.00)*	3.29 *(5.29)*	2.86 *(4.60)*	2.44 *(3.93)*	2.05 *(3.30)*	1.63 *(2.63)*
Slip %	6.95	7.35	7.64	7.74	8.12	8.22	7.64

Department of Agricultural Engineering

Dates of Test: October 7-24, 1980

Manufacturer: KUBOTA, LTD., 2-47 Shikitsu-Higashi 1-chome Naniwa-ku, Osaka Japan

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 47.9 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60°** ***(15°/15°)*** 0.8378 **Fuel weight** 6.976 lbs/gal *(0.836 kg/l)* **Oil SAE** 20-20W **API service classification** SB/SE-CA/CD **To motor** 1.500 gal *(5.679 l)* **Drained from motor** 1.382 gal *(5.230 l)* **Transmission and final drive lubricant** SAE 80 or tractor hydraulic fluid **Front axle lubricant** SAE 90 **Total time engine was operated** 41.5 hours

ENGINE: Make Kubota Diesel **Type** three cylinder vertical **Serial No.** D1301-DA-01341 **Crankshaft** lengthwise **Rated rpm** 2800 **Bore and stroke** 3.23″ × 3.23″ *(82 mm × 82 mm)* **Compression ratio** 21 to 1 **Displacement** 79.3 cu in *(1299 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** one paper element **Oil filter** one full flow paper cartridge **Fuel filter** one paper cartridge **Muffler** vertical **Cooling medium temperature control** one thermostat

CHASSIS: Type front wheel assist **Serial No.** L305DT-10249 **Tread width** rear 50.2″ *(1275 mm)* to 66.1″ *(1680 mm)* front 48.2″ *(1225 mm)* **Wheel base** 72.8″ *(1850 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 31.4″ *(798 mm)* Vertical distance above roadway 32.7″ *(830 mm)* Horizontal distance from center of rear wheel tread 0″ *(0 mm)* to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph *(km/h)*** first 0.8 *(1.3)* second 1.1 *(1.8)* third 1.6 *(2.5)* fourth 2.9 *(4.7)* fifth 3.6 *(5.8)* sixth 4.7 *(7.6)* seventh 6.8 *(10.9)* eighth 12.7 *(20.4)* reverse 1.4 *(2.3)*, 6.2 *(9.9)* **Clutch** dual plate dry disc operated by foot pedal. **Brakes** wet disc operated by two foot pedals which can be locked together **Steering** power assist **Turning radius** (on concrete surface with brake applied) right 110″ *(2.8 m)* left 110″ *(2.8 m)* (on concrete surface without brake) right 150″ *(3.8 m)* left 150″ *(3.8 m)* **Turning space diameter** (on concrete surface with brake applied) right 228″ *(5.8 m)* left 228″ *(5.8 m)* (on concrete surface without brake) right 307″ *(7.8 m)* left 307″ *(7.8 m)* **Power take-off** 540 rpm at 2534 engine rpm.

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump was 135°F *(57.3°C)*. Five gears were chosen between 15% slip and 10 mph *(16.1 km/h)*.

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)	Front Wheel Drive Disengaged dB(A)
Maximum Available Power—Two Hours	94.0	93.5
75% of Pull at Maximum Power—Ten Hours		91.5
50% of Pull at Maximum Power—Two Hours		91.5
50% of Pull at Reduced Engine Speed—Two Hours		89.5
Bystander in 8th (H4) gear		81.5

DRAWBAR PERFORMANCE
(Front Wheel Drive Engaged)

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temp. °F (°C) Cool-ing med	Air wet bulb	Air dry bulb	Barom. inch Hg *(kPa)*
					Maximum Available Power—Two Hours 6th (H2) Gear						
21.43 *(15.98)*	1859 *(8.27)*	4.32 *(6.96)*	2800	5.47	1.953 *(7.393)*	0.636 *(0.387)*	10.97 *(2.162)*	202 *(94.2)*	56 *(13.3)*	70 *(20.8)*	28.875 *(97.507)*
					MAXIMUM POWER IN SELECTED GEARS						
15.85 *(11.82)*	4397 *(19.56)*	1.35 *(2.18)*	2924	14.85		3rd (L3) Gear		189 *(86.9)*	46 *(7.8)*	51 *(10.6)*	28.960 *(97.794)*
22.47 *(16.76)*	2597 *(11.55)*	3.25 *(5.22)*	2800	7.67		5th (H1) Gear		195 *(90.3)*	53 *(11.7)*	64 *(17.8)*	28.930 *(97.692)*
22.26 *(16.60)*	1938 *(8.62)*	4.31 *(6.93)*	2801	5.80		6th (H2) Gear		196 *(90.8)*	51 *(10.6)*	60 *(15.6)*	28.950 *(97.760)*

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi *(kPa)*	Two 13.6-24; 4; 14 *(95)*	Two 13.6-24; 4; 14 *(95)*
Ballast	—Liquid (each)	400 lb *(181 kg)*	None
	—Cast Iron (each)	500 lb *(227 kg)*	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 8.3-16; 4; 22 *(150)*	Two 8.3-16; 4; 22 *(150)*
Ballast	—Liquid (each)	85 lb *(39 kg)*	None
	—Cast Iron (each)	50 lb *(23 kg)*	None
Height of Drawbar		14 in *(355 mm)*	14 in *(355 mm)*
Static Weight with Operator	—Rear	3700 lb *(1678 kg)*	1900 lb *(862 kg)*
	—Front	1660 lb *(753 kg)*	1390 lb *(630 kg)*
	—Total	5360 lb *(2431 kg)*	3290 lb *(1492 kg)*

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1371.**

LOUIS I. LEVITICUS
Engineer-in-Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

Kubota L305 DT Diesel

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Roy G. Arnold, Director

NEBRASKA TRACTOR TEST 1372 —KUBOTA L345 DT DIESEL
ALSO KUBOTA L345 DIESEL
8 SPEED

POWER TAKE-OFF PERFORMANCE

	Power Hp *(kW)*	Crank shaft speed rpm	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temperature °F (°C) Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg *(kPa)*
MAXIMUM POWER AND FUEL CONSUMPTION									
Rated Engine Speed—Two Hours (PTO Speed—597 rpm)									
	29.35 *(21.89)*	2800	2.296 *(8.691)*	0.546 *(0.332)*	12.78 *(2.519)*	202 *(94.3)*	62 *(16.8)*	75 *(23.8)*	28.770 *(97.152)*
Standard Power Take-off Speed (540 rpm)—One Hour									
	28.80 *(21.48)*	2532	2.256 *(8.540)*	0.547 *(0.332)*	12.76 *(2.515)*	206 *(96.7)*	63 *(17.4)*	75 *(23.9)*	28.745 *(97.068)*
VARYING POWER AND FUEL CONSUMPTION—Two Hours									
	25.46 *(18.99)*	2858	1.961 *(7.423)*	0.537 *(0.327)*	12.98 *(2.558)*	193 *(89.4)*	63 *(17.2)*	75 *(23.6)*	....
	0.00 *(0.00)*	3023	0.710 *(2.688)*	....	....	185 *(84.7)*	64 *(17.8)*	76 *(24.2)*	....
	13.13 *(9.79)*	2946	1.277 *(4.834)*	0.678 *(0.413)*	10.28 *(2.025)*	188 *(86.7)*	64 *(17.5)*	74 *(23.1)*	......
	30.20 *(22.52)*	2801	2.447 *(9.263)*	0.565 *(0.344)*	12.34 *(2.431)*	200 *(93.1)*	64 *(17.8)*	75 *(23.6)*	....
	6.66 *(4.97)*	2988	0.972 *(3.679)*	1.018 *(0.619)*	6.85 *(1.351)*	188 *(86.7)*	65 *(18.1)*	76 *(24.2)*	....
	19.56 *(14.59)*	2926	1.613 *(6.106)*	0.575 *(0.350)*	12.13 *(2.389)*	190 *(87.8)*	65 *(18.1)*	75 *(23.6)*	....
Av ***Av***	**15.84** ***(11.81)***	**2924**	**1.497** ***(5.667)***	**0.659** ***(0.401)***	**10.58** ***(2.084)***	**191** ***(88.1)***	**64** ***(17.7)***	**75** ***(23.7)***	**28.713** ***(96.961)***

DRAWBAR PERFORMANCE
(Front Wheel Drive Disengaged)

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temp. °F (°C) Cool-ing med	Air wet bulb	Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power—Two Hours 6th (H2) Gear											
25.27 *(18.84)*	2058 *(9.15)*	4.61 *(7.41)*	2802	6.66	2.365 *(8.953)*	0.653 *(0.397)*	10.68 *(2.105)*	194 *(89.7)*	56 *(13.3)*	73 *(22.5)*	28.945 *(97.743)*
75% of Pull at Maximum Power—Ten Hours 6th (H2) Gear											
20.92 *(15.60)*	1626 *(7.23)*	4.83 *(7.77)*	2889	5.18	1.935 *(7.326)*	0.645 *(0.392)*	10.81 *(2.130)*	186 *(85.7)*	41 *(4.7)*	47 *(8.2)*	28.929 *(97.689)*
50% of Pull at Maximum Power—Two Hours 6th (H2) Gear											
14.43 *(10.76)*	1089 *(4.84)*	4.97 *(8.00)*	2928	3.67	1.577 *(5.969)*	0.762 *(0.464)*	9.15 *(1.802)*	185 *(84.7)*	46 *(7.5)*	49 *(9.4)*	29.010 *(97.962)*
50% of Pull at Reduced Engine Speed—Two Hours 7th (H3) Gear											
14.37 *(10.71)*	1084 *(4.82)*	4.97 *(8.00)*	2038	3.52	1.218 *(4.612)*	0.592 *(0.360)*	11.79 *(2.323)*	186 *(85.3)*	54 *(11.9)*	62 *(16.7)*	29.005 *(97.946)*
MAXIMUM POWER IN SELECTED GEARS											
14.76 *(11.01)*	3795 *(16.88)*	1.46 *(2.35)*	2929	15.00		3rd (L3) Gear		187 *(85.8)*	47 *(8.3)*	56 *(13.3)*	28.650 *(96.747)*
25.39 *(18.93)*	3588 *(15.96)*	2.65 *(4.27)*	2800	13.25		4th (L4) Gear		191 *(88.1)*	48 *(8.9)*	59 *(15.0)*	28.650 *(96.747)*
26.00 *(19.39)*	2829 *(12.58)*	3.45 *(5.55)*	2800	9.25		5th (H1) Gear		191 *(88.3)*	48 *(8.9)*	59 *(15.0)*	28.650 *(96.747)*
26.72 *(19.93)*	2168 *(9.65)*	4.62 *(7.44)*	2799	6.25		6th (H2) Gear		190 *(87.8)*	42 *(5.6)*	49 *(9.4)*	28.640 *(96.713)*
25.39 *(18.94)*	1409 *(6.27)*	6.76 *(10.88)*	2799	4.51		7th (H3) Gear		190 *(87.8)*	48 *(8.9)*	59 *(15.0)*	28.650 *(96.747)*

LUGGING ABILITY IN 6th (H2) GEAR

Crankshaft Speed rpm	2799	2530	2233	1956	1678	1380
Pull—lbs *(kN)*	2168 *(9.65)*	2288 *(10.18)*	2343 *(10.42)*	2390 *(10.63)*	2462 *(10.95)*	2311 *(10.28)*
Increase in Pull %	0	6	8	10	14	7
Power—Hp *(kW)*	26.72 *(19.93)*	25.38 *(18.92)*	22.88 *(17.07)*	20.42 *(15.23)*	18.00 *(13.42)*	13.97 *(10.42)*
Speed—Mph *(km/h)*	4.62 *(7.44)*	4.16 *(6.70)*	3.66 *(5.90)*	3.20 *(5.16)*	2.74 *(4.41)*	2.27 *(3.65)*
Slip %	6.25	6.75	6.97	6.97	7.18	6.75

Department of Agricultural Engineering

Dates of Test: October 7-21, 1980

Manufacturer: KUBOTA, LTD., 2-47 Shikitsu-Higashi 1-chome Naniwa-ku, Osaka Japan

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 47.9 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60°** ***(15°/15°)*** 0.8378 **Fuel weight** 6.976 lbs/gal *(0.836 kg/l)* **Oil SAE** 20-20W **API service classification** SB/SE-CA/CD **To motor** 2.029 gal *(7.682 l)* **Drained from motor** 1.828 gal *(6.918 l)* **Transmission and final drive lubricant** SAE 80 or tractor hydraulic fluid **Front axle lubricant** SAE 90 **Total time engine was operated** 43.5 hours

ENGINE: Make Kubota Diesel **Type** four cylinder vertical **Serial No.** V1501-DA-03568 **Crankshaft** lengthwise **Rated rpm** 2800 **Bore and stroke** 3.00" × 3.23" *(76 mm × 82 mm)* **Compression ratio** 21 to 1 **Displacement** 90.7 cu in *(1487 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** one paper element **Oil filter** one full flow paper cartridge **Fuel filter** one paper cartridge **Muffler** vertical **Cooling medium temperature control** one thermostat

CHASSIS: Type front wheel assist **Serial No.** L345DT-11371 **Tread width** rear 46.1" *(1170 mm)* to 66.1" *(1680 mm)* front 49.0" *(1245 mm)* **Wheel base** 76.6" *(1945 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 35.2" *(893 mm)* Vertical distance above roadway 34.6" *(880 mm)* Horizontal distance from center of rear wheel tread 0" *(0 mm)* to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph** ***(km/h)*** first 0.9 *(1.5)* second 1.2 *(1.9)* third 1.7 *(2.7)* fourth 3.2 *(5.1)* fifth 3.9 *(6.3)* sixth 5.1 *(8.2)* seventh 7.4 *(11.8)* eighth 13.7 *(22.1)* reverse 1.6 *(2.6)*, 6.7 *(10.8)* **Clutch** dual plate dry disc operated by foot pedal **Brakes** wet disc operated by two foot pedals which can be locked together **Steering** power assist **Turning radius** (on concrete surface with brake applied) right 118" *(3.00 m)* left 118" *(3.00 m)* (on concrete surface without brake) right 150" *(3.80 m)* left 150" *(3.80 m)* **Turning space diameter** (on concrete surface with brake applied) right 244" *(6.20 m)* left 244" *(6.20 m)* (on concrete surface without brake) right 307" *(7.80 m)* left 307" *(7.80 m)* **Power take-off** 540 rpm at 2532 engine rpm.

REPAIRS and ADJUSTMENTS: During preliminary drawbar tests the front wheel drive linkage was found to be inoperative due to a mispositioned spring clip. After putting the clip in the correct position, the tests were continued.

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)	Front Wheel Drive Disengaged dB(A)
Maximum Available Power—Two Hours	92.5	93.0
75% of Pull at Maximum Power—Ten Hours		92.0
50% of Pull at Maximum Power—Two Hours		91.5
50% of Pull at Reduced Engine Speed—Two Hours		89.0
Bystander in 8th (H4) gear		82.5

DRAWBAR PERFORMANCE
(Front Wheel Drive Engaged)

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr *(l/h)*	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Fuel Consumption Hp.hr/gal *(kW.h/l)*	Temp. °F (°C) Cooling med	Temp. °F (°C) Air wet bulb	Temp. °F (°C) Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power—Two Hours 6th (H2) Gear											
25.02 *(18.66)*	1976 *(8.79)*	4.75 *(7.64)*	2799	5.04	2.383 *(9.021)*	0.664 *(0.404)*	10.50 *(2.068)*	193 *(89.2)*	55 *(12.8)*	72 *(22.2)*	28.925 *(97.675)*

MAXIMUM POWER IN SELECTED GEARS

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Gear	Cooling med	Air wet bulb	Air dry bulb	Barom. inch Hg *(kPa)*
17.77 *(13.25)*	4528 *(20.14)*	1.47 *(2.37)*	2910	14.83	3rd (L3) Gear	187 *(85.8)*	45 *(7.2)*	54 *(12.2)*	28.670 *(96.814)*
26.33 *(19.63)*	2078 *(9.24)*	4.75 *(7.65)*	2800	5.10	6th (H2) Gear	195 *(90.5)*	55 *(12.8)*	72 *(22.2)*	28.930 *(97.692)*

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi *(kPa)*	Two 13.6-28; 6; 16 *(110)*	Two 13.6-28; 6; 16 *(110)*
Ballast	—Liquid (each)	350 lb *(159 kg)*	None
	—Cast Iron (each)	470 lb *(213 kg)*	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 9.5-16; 6; 26 *(180)*	Two 9.5-16; 6; 26 *(180)*
Ballast	—Liquid (each)	100 lb *(45 kg)*	None
	—Cast Iron (each)	80 lb *(36 kg)*	None
Height of Drawbar		17 in *(430 mm)*	17 in *(430 mm)*
Static Weight with Operator	—Rear	3635 lb *(1649 kg)*	1995 lb *(905 kg)*
	—Front	1800 lb *(816 kg)*	1440 lb *(653 kg)*
	—Total	5435 lb *(2465 kg)*	3435 lb *(1558 kg)*

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump was 134°F *(56.9°C)*. Five gears were chosen between 15% slip and 10 mph *(16.1 km/h)*.

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1372.**

LOUIS I. LEVITICUS
Engineer-in-Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

Kubota L345 DT Diesel

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Roy G. Arnold, Director

NEBRASKA TRACTOR TEST 1373 — WHITE ISEKI 2-30 DIESEL 8 SPEED

POWER TAKE-OFF PERFORMANCE

	Power Hp *(kW)*	Crank shaft speed rpm	Fuel Consumption			Temperature °F *(°C)*			Barometer inch Hg *(kPa)*
			gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Cooling medium	Air wet bulb	Air dry bulb	
MAXIMUM POWER AND FUEL CONSUMPTION									
Rated Engine Speed—Two Hours (PTO Speed—645 rpm)									
	28.33 *(21.13)*	2600	2.366 *(8.956)*	0.583 *(0.355)*	11.97 *(2.359)*	211 *(99.3)*	57 *(14.1)*	75 *(23.9)*	28.050 *(98.097)*
Standard Power Take-off Speed (540 rpm)—One Hour									
	24.50 *(18.27)*	2176	2.037 *(7.711)*	0.580 *(0.353)*	12.03 *(2.369)*	209 *(98.1)*	56 *(13.5)*	75 *(23.7)*	29.055 *(98.114)*
VARYING POWER AND FUEL CONSUMPTION—Two Hours									
	25.39 *(18.93)*	2744	1.972 *(7.465)*	0.542 *(0.330)*	12.87 *(2.536)*	197 *(91.7)*	55 *(12.8)*	74 *(23.3)*	....
	0.00 *(0.00)*	2892	0.752 *(2.847)*	....	....	180 *(81.9)*	56 *(13.1)*	75 *(23.9)*	....
	12.92 *(9.63)*	2792	1.293 *(4.895)*	0.699 *(0.425)*	9.99 *(1.967)*	182 *(83.3)*	56 *(13.3)*	74 *(23.3)*	....
	28.35 *(21.14)*	2600	2.372 *(8.979)*	0.584 *(0.355)*	11.95 *(2.354)*	209 *(98.1)*	56 *(13.3)*	76 *(24.4)*	....
	6.58 *(4.91)*	2839	1.023 *(3.872)*	1.086 *(0.660)*	6.43 *(1.268)*	180 *(82.2)*	56 *(13.3)*	75 *(23.9)*	....
	19.26 *(14.36)*	2774	1.594 *(6.034)*	0.578 *(0.352)*	12.08 *(2.380)*	185 *(85.0)*	56 *(13.3)*	76 *(24.4)*	....
Av ***Av***	**15.42** ***(11.50)***	**2774**	**1.501** ***(5.682)***	**0.680** ***(0.413)***	**10.27** ***(2.024)***	**189** ***(87.1)***	**56** ***(13.2)***	**75** ***(23.9)***	**29.070** ***(98.165)***

DRAWBAR PERFORMANCE

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption			Temp. °F *(°C)*			Barom. inch Hg *(kPa)*
					gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Cool-ing med	Air wet bulb	Air dry bulb	
Maximum Available Power—Two Hours 6th (H2) Gear											
24.88 *(18.56)*	1783 *(7.93)*	5.23 *(8.42)*	2598	7.45	2.310 *(8.742)*	0.648 *(0.394)*	10.77 *(2.123)*	189 *(86.9)*	40 *(4.4)*	50 *(9.7)*	29.025 *(98.013)*
75% of Pull at Maximum Power—Ten Hours 6th (H2) Gear											
21.09 *(15.73)*	1387 *(6.17)*	5.70 *(9.18)*	2765	5.25	1.848 *(6.994)*	0.612 *(0.372)*	11.42 *(2.249)*	180 *(81.9)*	31 *(0.4)*	34 *(1.3)*	29.305 *(98.959)*
50% of Pull at Maximum Power—Two Hours 6th (H2) Gear											
14.29 *(10.65)*	918 *(4.08)*	5.84 *(9.40)*	2789	3.85	1.486 *(5.625)*	0.726 *(0.442)*	9.61 *(1.894)*	178 *(81.1)*	37 *(2.8)*	45 *(6.9)*	29.105 *(98.283)*
50% of Pull at Reduced Engine Speed—Two Hours 7th (H3) Gear											
14.51 *(10.82)*	929 *(4.13)*	5.86 *(9.43)*	1809	3.70	1.235 *(4.676)*	0.594 *(0.361)*	11.75 *(2.315)*	177 *(80.6)*	41 *(5.0)*	45 *(7.2)*	29.090 *(98.233)*
MAXIMUM POWER IN SELECTED GEARS											
16.51 *(12.31)*	2816 *(12.53)*	2.20 *(3.54)*	2751	14.93	4th (L4) Gear			181 *(82.5)*	41 *(5.0)*	49 *(9.4)*	29.070 *(98.165)*
24.67 *(18.40)*	2573 *(11.45)*	3.60 *(5.79)*	2600	12.22	5th (H1) Gear			190 *(87.5)*	41 *(5.0)*	48 *(8.9)*	29.090 *(98.233)*
25.75 *(19.20)*	1847 *(8.22)*	5.23 *(8.42)*	2599	7.57	6th (H2) Gear			189 *(87.2)*	41 *(5.0)*	49 *(9.4)*	29.060 *(98.131)*
25.81 *(19.24)*	1159 *(5.15)*	8.35 *(13.44)*	2601	4.46	7th (H3) Gear			187 *(86.1)*	40 *(4.4)*	50 *(10.0)*	29.040 *(98.064)*

LUGGING ABILITY IN 6th (H2) GEAR

Crankshaft Speed rpm	2599	2346	2080	1818	1545	1294
Pull—lbs *(kN)*	1847 *(8.22)*	1876 *(8.34)*	1901 *(8.46)*	1902 *(8.46)*	1845 *(8.21)*	1809 *(8.05)*
Increase in Pull %	0	2	3	3	0	–2
Power—Hp *(kW)*	25.75 *(19.20)*	23.58 *(17.58)*	21.18 *(15.79)*	18.51 *(13.80)*	15.29 *(11.40)*	12.59 *(9.39)*
Speed—Mph *(km/h)*	5.23 *(8.42)*	4.71 *(7.59)*	4.18 *(6.72)*	3.65 *(5.87)*	3.11 *(5.00)*	2.61 *(4.20)*
Slip %	7.57	7.71	7.81	7.71	7.53	7.43

Department of Agricultural Engineering

Dates of Test: October 22 — 29, 1980

MANUFACTURER: ISEKI AND CO., LTD., Tokyo, Japan

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane** No. 47.9 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60°** *(15°/15°)* 0.8385 **Fuel weight** 6.982 lbs/gal *(0.837 kg/l)* **Oil** White Farm Equipment Turbo-Diesel Oil **SAE** 30 **API service classification** CB/CD (DS) **To motor** 2.797 gal *(10.589 l)* **Drained from motor** 2.531 gal *(9.580 l)* **Transmission lubricant** SAE 80-90 **Hydraulic lubricant** White Farm Equipment type 55 hydraulic oil **Total time engine was operated** 41.5 hours

ENGINE: Make Isuzu Diesel **Type** three cylinder vertical **Serial No.** 3AD11-498L-532789 **Crankshaft** lengthwise **Rated rpm** 2600 **Bore and stroke** 3.386" x 3.386" *(86 mm x 86 mm)* **Compression ratio** 20 to 1 **Displacement** 91.4 cu in *(1498 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** one paper element **Oil filter** one full flow paper cartridge **Fuel Filter** one metal screen with sediment bowl and one paper cartridge **Muffler** vertical **Cooling medium temperature control** one thermostat.

CHASSIS: Type standard **Serial No.** 100870 J **Tread width** rear 47.2" *(1200 mm)* to 59.8" *(1520 mm)* front 43.3" *(1100 mm)* to 59.1" *(1500 mm)* **Wheel base** 68.9" *(1750 mm)* **Center of Gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 26.6" *(676 mm)* Vertical distance above roadway 26.6" *(675 mm)* Horizontal distance from center of rear wheel tread 0" *(0 mm)* to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph** ***(km/h)*** first 0.8 *(1.3)* second 1.1 *(1.8)* third 1.7 *(2.7)* fourth 2.4 *(3.9)* fifth 4.0 *(6.5)* sixth 5.6 *(9.0)* seventh 8.6 *(13.9)* eighth 12.2 *(19.7)* reverse 1.1 *(1.8)*, 5.6 *(9.0)* **Clutch** dry single disc operated by foot pedal **Brakes** drum and shoe operated by two foot pedals which can be locked together **Steering** mechanical **Turning radius** (on concrete surface with brake applied) right 105" *(2.57 mm)* left 103" *(2.62 m)* (on concrete surface without brake) right 116" *(2.95 m)* left 114" *(2.90 m)* **Turning space diameter** (on concrete surface with brake applied) right 222" *(5.64 m)* left 218" *(5.54 m)* (on concrete surface without brake) right 244" *(6.20 m)* left 240" *(6.10)* **Power take-off** 540 rpm at 2176 engine rpm.

REPAIRS and ADJUSTMENTS: No repairs or adjustments

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)
Maximum Available Power—Two Hours	96.5
75% of Pull at Maximum Power—Ten Hours	94.5
50% of Pull at Maximum Power—Two Hours	93.5
50% of Pull at Reduced Engine Speed—Two Hours	89.0
Bystander in 8th (H4) gear	83.0

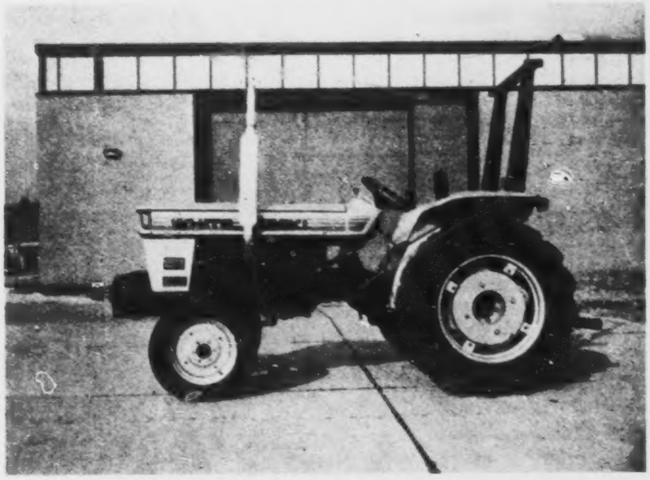
TIRES, BALLAST AND WEIGHT		**With Ballast**	**Without Ballast**
Rear Tires	—No., size, ply & psi *(kPa)*	Two 12.4-24; 4; 14 *(95)*	Two 12.4-24; 4; 14 *(95)*
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	340 lb *(154 kg)*	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 5.00-15; 4; 44 *(305)*	Two 5.00-15; 4; 44 *(305)*
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	84 lb *(38 kg)*	None
Height of Drawbar		12.5 in *(315 mm)*	12.5 in *(315 mm)*
Static Weight with Operator	—Rear	2595 lb *(1177 kg)*	1915 lb *(869 kg)*
	Front	1258 lb *(571 kg)*	1090 lb *(494 kg)*
	Total	3853 lb *(1748 kg)*	3005 lb *(1363 kg)*

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump was 146°F *(63.4° C)*. Four gears were chosen between 15% slip and 10 mph *(16.1 km/h)*.

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1373.**

LOUIS I. LEVITICUS
Engineer-in-Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers



White Iseki 2-30 Diesel

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Roy G. Arnold, Director

NEBRASKA TRACTOR TEST 1374 — WHITE ISEKI 2-35 DIESEL 8 SPEED

POWER TAKE-OFF PERFORMANCE

	Power Hp *(kW)*	Crank shaft speed rpm	Fuel Consumption			Temperature °F *(°C)*			Barometer inch Hg *(kPa)*
			gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Cooling medium	Air wet bulb	Air dry bulb	
MAXIMUM POWER AND FUEL CONSUMPTION									
Rated Engine Speed—Two Hours (PTO Speed—595 rpm)									
	32.84 *(24.49)*	2400	2.604 *(9.857)*	0.554 *(0.337)*	12.61 *(2.485)*	214 *(101.3)*	55 *(12.6)*	75 *(23.8)*	29.050 *(98.096)*
Standard Power Take-off Speed (540 rpm)—One Hour									
	30.94 *(23.07)*	2176	2.441 *(9.240)*	0.551 *(0.335)*	12.68 *(2.497)*	212 *(100.2)*	54 *(12.2)*	75 *(23.9)*	29.035 *(98.047)*
VARYING POWER AND FUEL CONSUMPTION—Two Hours									
	28.88 *(21.54)*	2480	2.153 *(8.150)*	0.521 *(0.317)*	13.41 *(2.643)*	201 *(93.6)*	54 *(12.2)*	75 *(23.9)*	....
	0.00 *(0.00)*	2616	0.791 *(2.994)*	....	....	177 *(80.6)*	54 *(12.2)*	75 *(23.9)*	....
	14.73 *(10.98)*	2531	1.388 *(5.254)*	0.658 *(0.400)*	10.61 *(2.090)*	183 *(83.9)*	54 *(12.2)*	75 *(23.9)*	....
	32.85 *(24.50)*	2401	2.617 *(9.906)*	0.556 *(0.338)*	12.56 *(2.473)*	211 *(99.2)*	54 *(12.2)*	75 *(23.9)*	....
	7.46 *(5.56)*	2567	1.066 *(4.035)*	0.997 *(0.607)*	7.00 *(1.378)*	180 *(82.2)*	54 *(12.2)*	76 *(24.2)*	....
	21.89 *(16.32)*	2509	1.732 *(6.556)*	0.552 *(0.336)*	12.64 *(2.489)*	186 *(85.3)*	54 *(12.2)*	76 *(24.2)*	....
Av ***Av***	**17.64** ***(13.15)***	**2517**	**1.624** ***(6.148)***	**0.643** ***(0.391)***	**10.86** ***(2.139)***	**189** ***(87.4)***	**54** ***(12.2)***	**75** ***(24.0)***	**29.023** ***(98.007)***

DRAWBAR PERFORMANCE

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption			Temp. °F *(°C)*			Barom. inch Hg *(kPa)*
					gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Cool-ing med	Air wet bulb	Air dry bulb	
Maximum Available Power—Two Hours 6th (H2) Gear											
28.55 *(21.29)*	2152 *(9.57)*	4.98 *(8.01)*	2400	8.63	2.542 *(9.623)*	0.622 *(0.378)*	11.23 *(2.213)*	184 *(84.4)*	44 *(6.4)*	51 *(10.3)*	29.140 *(98.401)*
75% of Pull at Maximum Power—Ten Hours 6th (H2) Gear											
24.19 *(18.04)*	1705 *(7.58)*	5.32 *(8.56)*	2497	6.23	2.062 *(7.807)*	0.595 *(0.362)*	11.73 *(2.310)*	181 *(82.7)*	47 *(8.1)*	54 *(12.1)*	29.100 *(98.266)*
50% of Pull at Maximum Power—Two Hours 6th (H2) Gear											
16.68 *(12.44)*	1133 *(5.04)*	5.52 *(8.89)*	2532	4.02	1.611 *(6.099)*	0.674 *(0.410)*	10.35 *(2.039)*	177 *(80.6)*	42 *(5.3)*	45 *(7.2)*	29.085 *(98.216)*
50% of Pull at Reduced Engine Speed—Two Hours 7th (H3) Gear											
16.70 *(12.45)*	1133 *(5.04)*	5.53 *(8.90)*	1640	3.86	1.253 *(4.744)*	0.524 *(0.319)*	13.33 *(2.625)*	179 *(81.4)*	51 *(10.3)*	58 *(14.2)*	29.040 *(98.064)*
MAXIMUM POWER IN SELECTED GEARS											
27.39 *(20.42)*	2978 *(13.25)*	3.45 *(5.55)*	2460	14.72	5th (H1) Gear			183 *(83.6)*	39 *(3.9)*	45 *(7.2)*	29.180 *(98.536)*
30.06 *(22.41)*	2268 *(10.09)*	4.97 *(8.00)*	2399	8.77	6th (H2) Gear			184 *(84.2)*	40 *(4.4)*	46 *(7.8)*	29.180 *(98.536)*
30.37 *(22.64)*	1424 *(6.33)*	8.00 *(12.87)*	2401	5.09	7th (H3) Gear			183 *(83.9)*	42 *(5.6)*	48 *(8.9)*	29.150 *(98.435)*

LUGGING ABILITY IN 6th (H2) GEAR

Crankshaft Speed rpm	2399	2156	1907	1674	1436	1188
Pull—lbs *(kN)*	1268 *(10.09)*	2376 *(10.57)*	2408 *(10.71)*	2417 *(10.75)*	2407 *(10.71)*	2347 *(10.44)*
Increase in Pull %	0	5	6	7	6	3
Power—Hp *(kW)*	30.06 *(22.41)*	28.12 *(20.97)*	25.18 *(18.78)*	22.16 *(16.53)*	18.92 *(14.11)*	15.33 *(11.43)*
Speed—Mph *(km/h)*	4.97 *(8.00)*	4.44 *(7.14)*	3.92 *(6.31)*	3.44 *(5.53)*	2.95 *(4.74)*	2.45 *(3.94)*
Slip %	8.77	9.34	9.53	9.53	9.62	9.15

Department of Agricultural Engineering

Dates of Test: October 22 — November 3,1980

MANUFACTURER: ISEKI AND CO., LTD., Tokyo, Japan

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane** No. 47.9 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60°** *(15°/15°)* 0.8385 **Fuel weight** 6.982 lbs/gal *(0.837 kg/l)* **Oil** White Farm Equipment Turbo-Diesel Oil **SAE** 30 **API service classification** CB/CD (DS) **To motor** 2.719 gal *(10.293 l)* **Drained from motor** 2.568 gal *(9.719 l)* **Transmission lubricant** SAE 80-90 **Hydraulic lubricant** White Farm Equipment type 55 hydraulic oil **Total time engine was operated** 32.0 hours

ENGINE: Make Isuzu Diesel **Type** three cylinder vertical **Serial No.** 531954 **Crankshaft** lengthwise **Rated rpm** 2400 **Bore and stroke** 3.386" x 4.02" *(86 mm x 102 mm)* **Compression ratio** 20 to 1 **Displacement** 108.4 cu in *(1777 ml)* **Cranking system** 12 volt **Lubrication** pressure **Air cleaner** one paper element **Oil filter** one full flow paper cartridge **Fuel Filter** one metal screen with sediment bowl and one paper cartridge **Muffler** vertical **Cooling medium temperature control** one thermostat.

CHASSIS: Type standard **Serial No.** 004408 J **Tread width** rear 46.8" *(1190 mm)* to 60.6" *(1540 mm)* front 43.3" *(1100 mm)* to 59.1" *(1500 mm)* **Wheel base** 68.9" *(1750 mm)* **Center of Gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 26.5" *(673 mm)* Vertical distance above roadway 27.9" *(709 mm)* Horizontal distance from center of rear wheel tread 0" *(0 mm)* to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph** *(km/h)* first 0.7 *(1.2)* second 1.0 *(1.6)* third 1.6 *(2.5)* fourth 2.2 *(3.6)* fifth 3.9 *(6.2)* sixth 5.3 *(8.5)* seventh 8.2 *(13.2)* eighth 11.6 *(18.7)* reverse 1.0 *(1.6)*, 5.3 *(8.5)* **Clutch** dry single disc operated by foot pedal **Brakes** drum and shoe operated by two foot pedals which can be locked together **Steering** power assist **Turning radius** (on concrete surface with brake applied) right 108" *(2.75 mm)* left 105" *(2.67 m)* (on concrete surface without brake) right 120" *(3.05 m)* left 118" *(3.00 m)* **Turning space diameter** (on concrete surface with brake applied) right 230" *(5.84 m)* left 224" *(5.69 m)* (on concrete surface without brake) right 254" *(6.45 m)* left 250" *(6.35)* **Power take-off** 540 rpm at 2176 engine rpm.

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)
Maximum Available Power—Two Hours	96.5
75% of Pull at Maximum Power—Ten Hours	94.0
50% of Pull at Maximum Power—Two Hours	92.0
50% of Pull at Reduced Engine Speed—Two Hours	89.0
Bystander in 8th (H4) gear	82.5

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi *(kPa)*	Two 13.6-24; 4; 14 *(95)*	Two 13.6-24; 4; 14 *(95)*
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	330 lb *(150 kg)*	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 5.50-16; 6; 40 *(275)*	Two 5.50-16; 6; 40 *(275)*
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	70 lb *(32 kg)*	None
Height of Drawbar		13.5 in *(345 mm)*	13.5 in *(345 mm)*
Static Weight with Operator	—Rear	2680 lb *(1216 kg)*	2020 lb *(916 kg)*
	Front	1290 lb *(585 kg)*	1150 lb *(522 kg)*
	Total	3970 lb *(1801 kg)*	3170 lb *(1438 kg)*

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump was 145°F *(62.8° C)*. Three gears were chosen between 15% slip and 10 mph *(16.1 km/h)*.

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1374.**

LOUIS I. LEVITICUS
Engineer-in-Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

White Iseki 2-35 Diesel

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Roy G. Arnold, Director

NEBRASKA TRACTOR TEST 1375 — WHITE 4-175 FIELD BOSS DIESEL 18 SPEED

POWER TAKE-OFF PERFORMANCE

Power Hp *(kW)*	Crank shaft speed rpm	Fuel Consumption			Temperature °F *(°C)*			Barometer inch Hg *(kPa)*
		gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Cooling medium	Air wet bulb	Air dry bulb	
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—1023 rpm)								
151.69	2600	9.920	0.457	15.29	177	54	75	29.297
(113.12)		*(37.551)*	*(0.278)*	*(3.012)*	*(80.7)*	*(12.3)*	*(23.9)*	*(98.930)*
Standard Power Take-off Speed (1000 rpm) — One Hour								
151.29	2542	9.759	0.450	15.50	177	54	75	29.293
(112.82)		*(36.942)*	*(0.274)*	*(3.054)*	*(80.8)*	*(12.2)*	*(23.9)*	*(98.916)*
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
133.45	2694	9.075	0.475	14.71	177	55	77	......
(99.51)		*(34.353)*	*(0.289)*	*(2.897)*	*(80.3)*	*(12.5)*	*(24.7)*	......
0.00	2857	3.841	.....	.....	174	54	75	......
(0.00)		*(14.540)*	.....	.....	*(78.6)*	*(11.9)*	*(23.6)*	......
69.15	2786	6.325	0.639	10.93	175	54	76	......
(51.57)		*(23.943)*	*(0.388)*	*(2.154)*	*(79.4)*	*(11.9)*	*(24.2)*	......
151.99	2601	9.900	0.455	15.35	178	54	76	......
(113.34)		*(37.476)*	*(0.277)*	*(3.024)*	*(81.1)*	*(12.2)*	*(24.2)*	......
34.90	2823	5.169	1.034	6.75	174	54	75	......
(26.02)		*(19.567)*	*(0.629)*	*(1.330)*	*(78.9)*	*(12.2)*	*(23.9)*	......
102.09	2746	7.691	0.526	13.27	175	54	75	......
(76.13)		*(29.114)*	*(0.320)*	*(2.615)*	*(79.4)*	*(12.2)*	*(23.9)*	......
Av 81.93	**2751**	**7.000**	**0.597**	**11.70**	**175**	**54**	**75**	**29.297**
Av *(61.10)*		***(26.498)***	***(0.363)***	***(2.306)***	***(79.6)***	***(12.2)***	***(24.1)***	***(98.930)***

DRAWBAR PERFORMANCE

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption			Temp. °F *(°C)*			Barom. inch Hg *(kPa)*
					gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Cool-ing med	Air wet bulb	Air dry bulb	
Maximum Available Power—Two Hours 8th (3D) Gear											
127.15	10107	4.72	2600	3.25	9.811	0.539	12.96	174	52	64	28.925
(94.82)	*(44.96)*	*(7.59)*			*(37.138)*	*(0.328)*	*(2.553)*	*(78.9)*	*(10.8)*	*(17.8)*	*(97.675)*
75% of Pull at Maximum Power—Ten Hours 8th (3D) Gear											
103.70	7789	4.99	2727	2.33	8.654	0.583	11.98	173	46	57	29.108
(77.33)	*(34.65)*	*(8.03)*			*(32.760)*	*(0.354)*	*(2.361)*	*(78.5)*	*(7.9)*	*(14.1)*	*(98.293)*
50% of Pull at Maximum Power—Two Hours 8th (3D) Gear											
71.67	5246	5.12	2780	1.69	7.161	0.698	10.01	172	44	50	29.070
(53.45)	*(23.33)*	*(8.25)*			*(27.108)*	*(0.424)*	*(1.972)*	*(77.8)*	*(6.4)*	*(10.0)*	*(98.165)*
50% of Pull at Reduced Engine Speed—Two Hours 14th (5D) Gear											
70.88	5198	5.11	1465	1.65	4.816	0.474	14.72	172	49	62	29.030
(52.83)	*(23.12)*	*(8.23)*			*(18.230)*	*(0.289)*	*(2.899)*	*(77.5)*	*(9.4)*	*(16.4)*	*(98.030)*
MAXIMUM POWER IN SELECTED GEARS											
109.98	19905	2.07	2688	14.68	3rd (1O) Gear			171	36	37	29.050
(82.02)	*(88.54)*	*(3.33)*						*(76.9)*	*(2.2)*	*(2.8)*	*(98.097)*
125.60	16319	2.89	2599	6.34	4rd (2U) Gear			175	51	62	28.910
(93.66)	*(72.59)*	*(4.65)*						*(79.2)*	*(10.6)*	*(16.7)*	*(97.625)*
130.41	13761	3.55	2600	4.61	5th (2D) Gear			175	50	60	28.910
(97.25)	*(61.21)*	*(5.72)*						*(79.2)*	*(10.0)*	*(15.6)*	*(97.625)*
129.13	12535	3.86	2599	4.15	6th (3U) Gear			175	50	60	28.910
(96.29)	*(55.76)*	*(6.22)*						*(79.2)*	*(10.0)*	*(15.6)*	*(97.625)*
129.16	11292	4.29	2599	3.60	7th (2O) Gear			175	50	60	28.910
(96.31)	*(50.23)*	*(6.90)*						*(79.2)*	*(10.0)*	*(15.6)*	*(97.625)*
130.59	10385	4.72	2598	3.21	8th (3D) Gear			174	48	58	28.910
(97.38)	*(46.19)*	*(7.59)*						*(78.9)*	*(8.9)*	*(14.4)*	*(97.625)*
131.93	9412	5.26	2600	2.82	9th (4U) Gear			175	51	62	28.910
(98.38)	*(41.86)*	*(8.46)*						*(79.2)*	*(10.6)*	*(16.7)*	*(97.625)*
127.69	8445	5.67	2599	2.50	10th (3O) Gear			175	51	62	28.920
(95.22)	*(37.56)*	*(9.13)*						*(79.2)*	*(10.6)*	*(16.7)*	*(97.625)*
133.72	7843	6.39	2598	2.42	11th (4D) Gear			175	51	63	28.910
(99.72)	*(34.89)*	*(10.29)*						*(79.4)*	*(10.6)*	*(17.2)*	*(97.625)*
129.88	6511	7.48	2599	2.01	12th (5U) Gear			175	51	63	28.910
(96.85)	*(28.96)*	*(12.04)*						*(79.4)*	*(10.6)*	*(17.2)*	*(97.625)*
130.41	6375	7.67	2600	1.85	13th (4O) Gear			174	51	63	28.910
(97.25)	*(28.36)*	*(12.35)*						*(79.2)*	*(10.6)*	*(17.2)*	*(97.625)*
128.80	5317	9.08	2600	1.53	14th (5D) Gear			175	51	63	28.910
(96.05)	*(23.65)*	*(14.62)*						*(79.2)*	*(10.6)*	*(17.2)*	*(97.625)*

Department of Agricultural Engineering

Dates of Test: October 24 — November 6,1980

MANUFACTURER: WHITE FARM EQUIPMENT COMPANY, 2625 Butterfield Road, Oak Brook, Illinois 60521

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane** No. 47.9 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60°** *(15°/15°)* 0.8385 **Fuel weight** 6.982 lbs/gal *(0.837 kg/l)* **Oil SAE** 30 **API service classification** CB/CD (DS) **To motor** 2.707 gal *(10.248 l)* **Drained from motor** 1.790 gal *(6.776 l)* **Transmission and final drive lubricant** White Farm Equipment Universal tractor Hydraulic transmission Fluid **Hydraulic lubricant** White Farm Equipment Co. type 55 Hydraulic Oil **Total time engine was operated** 40.0 hours

ENGINE: Make Caterpillar Diesel **Type** Eight cylinder vee **Serial No.** 90N 43983 **Crankshaft** lengthwise **Rated rpm** 2600 **Bore and stroke** 4.5" x 5.0" *(114.3 mm x 127 mm)* **Compression ratio** 16.5 to 1 **Displacement** 636 cu in *(10424 ml)* **Cranking system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements with aspirator **Oil filter** two full flow cartridges **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for transmission and hydraulic oil **Fuel Filter** one paper cartridge **Muffler** underhood **Exhaust** vertical **Cooling medium temperature control** two thermostats.

CHASSIS: Type Four wheel drive with duals **Serial No.** 292296-422 **Tread width** rear 60" *(1524 mm)* to 108" *(2743 mm)* front 60" *(1524 mm)* to 108" *(2743 mm)* **Wheel base** 118.4" *(3007 mm)* **Center of Gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 77.6" *(1971 mm)* Vertical distance above roadway 37.4" *(949 mm)* Horizontal distance from center of rear wheel tread 0" *(0 mm)* to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial (3) range operator controlled power shift **Advertised speeds mph (km/h)** first 1.6 *(2.6)* second 1.9 *(3.0)* third 2.3 *(3.7)* fourth 3.0 *(4.8)* fifth 3.7 *(5.9)* sixth 3.9 *(6.2)* seventh 4.4 *(7.0)* eighth 4.8 *(7.7)* ninth 5.3 *(8.5)* tenth 5.7 *(9.2)* eleventh 6.4 *(10.3)* twelfth 7.5 *(12.1)* thirteenth 7.7 *(12.4)* fourteenth 9.0 *(14.5)* fifteenth 10.8 *(17.4)* sixteenth 13.1 *(21.1)* seventeenth 15.9 *(25.6)* eighteenth 19.0 *(30.6)* reverse 1.9 *(3.0)*, 2.3 *(3.7)*, 2.8 *(4.5)*, 4.8 *(7.7)*, 5.8 *(9.3)*, 6.9 *(11.1)* **Clutch** dry single plate operated by foot pedal **Brakes** dry triple disc hydraulically power actuated and operated by one foot pedal **Steering** hydrostatic and articulated **Turning radius** (on concrete surface without brake) right 218.3" *(5.54 mm)* left 216.8" *(5.51 m)* **Turning space diameter** (on concrete surface without brake) right 458.6" *(11.65 m)* left 455.6" *(11.57 m)* **Power take-off** 1000 rpm at 2542 engine rpm.

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

LUGGING ABILITY IN 8th (3D) GEAR

Crankshaft Speed rpm	2598	2348	2075	1816	1553	1297	1031	795
Pull—lbs	10385	11166	11881	12757	13595	13961	14028	13057
(kN)	*(46.19)*	*9.67)*	*(52.85)*	*(56.75)*	*(60.47)*	*(62.10)*	*(62.40)*	*(58.08)*
Increase in Pull %	0	8	14	23	31	34	35	26
Power—Hp	130.59	126.49	118.58	111.02	100.73	86.26	68.79	49.53
(kW)	*(97.38)*	*(94.32)*	*(88.42)*	*(82.78)*	*(75.11)*	*(64.33)*	*(51.29)*	*(36.93)*
Speed—Mph	4.72	4.25	3.74	3.26	2.78	2.32	1.84	1.42
(km/h)	*(7.59)*	*(6.84)*	*(6.02)*	*(5.25)*	*(4.47)*	*(3.73)*	*(2.96)*	*(2.29)*
Slip %	3.21	3.68	3.84	4.15	4.46	4.76	4.76	4.46

TRACTOR SOUND LEVEL WITH CAB	dB(A)
Maximum Available Power—Two Hours	81.0
75% of Pull at Maximum Power—Ten Hours	81.0
50% of Pull at Maximum Power—Two Hours	80.5
50% of Pull at Reduced Engine Speed—Two Hours	77.5
Bystander in 18th (6O) gear	94.0

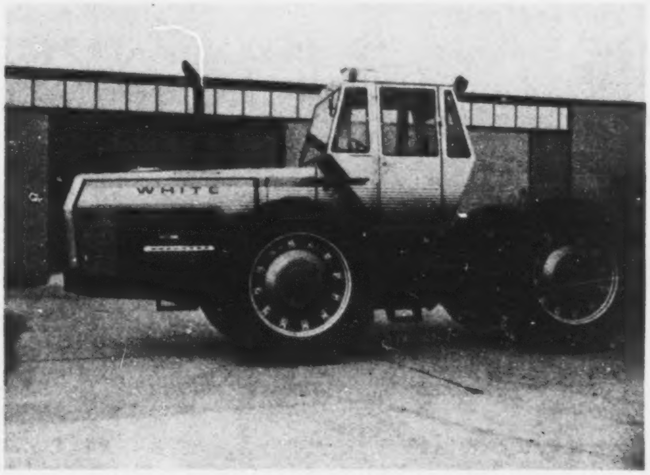
TIRES, BALLAST AND WEIGHT	Tested Without Ballast
Rear Tires—No., size, ply & psi *(kPa)*	Four 18.4-38; 8; 12 *(85)*
Ballast—Liquid (each)	None
—Cast Iron (each)	None
Front Tires—No., size, ply & psi *(kPa)*	Four 18.4-38; 8; 12 *(85)*
Ballast—Liquid (each)	None
—Cast Iron (each)	None
Height of Drawbar	20.5 in *(520 mm)*
Static Weight with Operator—Rear	7590 lb *(3443 kg)*
Front	12830 lb *(5820 kg)*
Total	20420 lb *(9263 kg)*

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump was 156°F *(68.6°C)*. Twelve gears were chosen between 15% slip and 10 mph *(16.1 km/h)*.

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1375.**

LOUIS I. LEVITICUS
Engineer-in-Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers



White 4-175 Field Boss Diesel

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Roy G. Arnold, Director

NEBRASKA TRACTOR TEST 1376 —INTERNATIONAL 884 ROWCROP DIESEL 16 SPEED

POWER TAKE-OFF PERFORMANCE

	Power Hp *(kW)*	Crank shaft speed rpm	Fuel Consumption			Temperature °F *(°C)*			Barometer inch Hg *(kPa)*
			gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Cooling medium	Air wet bulb	Air dry bulb	
MAXIMUM POWER AND FUEL CONSUMPTION									
Rated Engine Speed—Two Hours (PTO Speed—1096 rpm)									
	72.91 *(54.37)*	2400	4.737 *(17.931)*	0.454 *(0.276)*	15.39 *(3.032)*	195 *(90.7)*	60 *(15.4)*	75 *(24.1)*	28.647 *(96.735)*
Standard Power Take-off Speed (1000 rpm)—One Hour									
	69.76 *(52.02)*	2190	4.426 *(16.754)*	0.443 *(0.269)*	15.76 *(3.105)*	198 *(92.4)*	60 *(15.8)*	78 *(25.8)*	28.580 *(96.510)*
VARYING POWER AND FUEL CONSUMPTION—Two Hours									
	64.11 *(47.81)*	2482	4.232 *(16.020)*	0.461 *(0.280)*	15.15 *(2.984)*	192 *(88.9)*	62 *(16.7)*	82 *(27.5)*	....
	0.00 *(0.00)*	2651	1.461 *(5.530)*	....	....	181 *(82.5)*	61 *(16.1)*	81 *(27.2)*	....
	33.27 *(24.81)*	2577	2.797 *(10.588)*	0.587 *(0.357)*	11.89 *(2.343)*	186 *(85.6)*	61 *(16.1)*	81 *(27.2)*	....
	72.12 *(53.78)*	2400	4.714 *(17.844)*	0.456 *(0.278)*	15.30 *(3.014)*	197 *(91.4)*	61 *(16.1)*	82 *(27.5)*	....
	16.87 *(12.58)*	2614	2.213 *(8.377)*	0.916 *(0.557)*	7.62 *(1.502)*	181 *(82.8)*	62 *(16.4)*	82 *(27.5)*	....
	48.93 *(36.49)*	2528	3.459 *(13.094)*	0 494 *(0.300)*	14.15 *(2.787)*	188 *(86.7)*	62 *(16.4)*	82 *(27.8)*	....
Av ***Av***	**39.22** ***(29.25)***	**2542**	**3.146** ***(11.909)***	**0.560** ***(0.341)***	**12.47** ***(2.456)***	**187** ***(86.3)***	**61** ***(16.3)***	**81** ***(27.4)***	**28.543** ***(96.387)***

DRAWBAR PERFORMANCE

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption			Temp. °F *(°C)*			Barom inch Hg *(kPa)*
					gal/hr *(l/h)*	lb/hp.hr *(kg/kw.h)*	Hp.hr/gal *(kW.h/l)*	Cool-ing med	Air wet bulb	Air dry bulb	
Maximum Available Power—Two Hours 11th (2HiTA) Gear											
63.97 *(47.70)*	4331 *(19.26)*	5.54 *(8.91)*	2400	5.28	4.744 *(17.959)*	0.518 *(0.315)*	13.48 *(2.656)*	187 *(85.8)*	43 *(5.8)*	51 *(10.6)*	29.100 *(98.266)*
75% of Pull at Maximum Power—Ten Hours 11th (2HiTA) Gear											
50.77 *(37.86)*	3283 *(14.60)*	5.80 *(9.33)*	2478	3.96	3.932 *(14.882)*	0.541 *(0.329)*	12.91 *(2.544)*	186 *(85.6)*	54 *(12.1)*	68 *(19.9)*	28.446 *(96.058)*
50% of Pull at Maximum Power—Two Hours 11th (2HiTA) Gear											
35.02 *(26.11)*	2192 *(9.75)*	5.99 *(9.64)*	2531	2.81	3 169 *(11.995)*	0.632 *(0.384)*	11.05 *(2.177)*	185 *(85.0)*	56 *(13.3)*	73 *(22.8)*	28.600 *(96.578)*
50% of Pull at Reduced Engine Speed—Two Hours 13th (3HiTA) Gear											
35.07 *(26.15)*	2187 *(9.73)*	6.01 *(9.67)*	1560	2.71	2.489 *(9.420)*	0.496 *(0.301)*	14.09 *(2.776)*	186 *(85.6)*	55 *(12.5)*	75 *(23.6)*	28.600 *(96.578)*
MAXIMUM POWER IN SELECTED GEARS											
55.53 *(41.41)*	8116 *(36.10)*	2.57 *(4.13)*	2460	12.34	5th (3LoTA) Gear			188 *(86.4)*	55 *(12.8)*	70 *(21.1)*	28.610 *(96.612)*
62.21 *(46.39)*	7554 *(33.60)*	3.09 *(4.97)*	2400	10.35	6th (3LoDD) Gear			186 *(85.6)*	43 *(6.1)*	52 *(11.1)*	29.110 *(98.300)*
63.09 *(47.05)*	6711 *(29.85)*	3.53 *(5.67)*	2400	8.63	7th (4LoTA) Gear			186 *(85.6)*	43 *(6.1)*	52 *(11.1)*	29.110 *(98.300)*
64.93 *(48.42)*	5830 *(25.93)*	4.18 *(6.72)*	2398	7.28	8th (1HiTA) Gear			187 *(86.1)*	42 *(5.6)*	51 *(10.6)*	29.120 *(98.334)*
63.94 *(47.68)*	5530 *(24.60)*	4.34 *(6.98)*	2400	6.91	9th (4LoDD) Gear			187 *(85.8)*	42 *(5.6)*	51 *(10.6)*	29.120 *(98.334)*
64.97 *(48.45)*	4759 *(21.17)*	5.12 *(8.24)*	2398	5.76	10th (1HiDD) Gear			187 *(85.8)*	41 *(5.0)*	50 *(10.0)*	29.130 *(98.368)*
65.39 *(48.76)*	4429 *(19.70)*	5.54 *(8.91)*	2401	5.38	11th (2HiTA) Gear			187 *(85.8)*	40 *(4.4)*	47 *(8.3)*	29.140 *(98.401)*
64.71 *(48.25)*	3593 *(15.98)*	6.75 *(10.87)*	2400	4.26	12th (2HiDD) Gear			187 *(85.8)*	43 *(6.1)*	52 *(11.1)*	29.100 *(98.266)*
63.39 *(47.27)*	2579 *(11.47)*	9.22 *(14.83)*	2399	2.98	13th (3HiTA) Gear			187 *(85.8)*	43 *(6.1)*	52 *(11.1)*	29.100 *(98.266)*

Department of Agricultural Engineering

Dates of Test: November 5-13, 1980

MANUFACTURER: INTERNATIONAL HARVESTER COMPANY, 401 North Michigan Avenue, Chicago, IL 60611.

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 47.9 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60°** ***(15°/15°)*** 0.8385 **Fuel weight** 6.982 lbs/gal *(0.837 kg/l)* **Oil SAE** 30 **API service classification** CA/CD-SC/SE **To motor** 1.972 gal *(7.465 l)* **Drained from motor** 1.874 gal *(7.095 l)* **Transmission and final drive lubricant** I.H. Hytran Fluid **Total time engine was operated** 44.0 hours

ENGINE Make International Diesel **Type** four cylinder vertical **Serial No.** 268DT2D051557* **Crankshaft** lengthwise **Rated rpm** 2400 **Bore and stroke** 3.937" × 5.51" *(100 mm × 139.9 mm)* **Compression ratio** 16 to 1 **Displacement** 268 cu in *(4392 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements **Oil filter** one full flow paper cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** two paper elements **Muffler** vertical **Cooling medium temperature control** one thermostat

CHASSIS: Type standard **Serial No.** B650011B005349-* **Tread width** rear 52" *(1321 mm)* to 100" *(2540 mm)* front 52" *(1321 mm)* to 80" *(2032 mm)* **Wheel base** 84" *(2134 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 27.2" *(690 mm)* Vertical distance above roadway 31.6" *(803 mm)* Horizontal distance from center of rear wheel tread 0" *(0 mm)* to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial (2) range operator controlled powershift **Advertised speeds mph (km/h)** first 1.4 *(2.2)* second 1.7 *(2.7)* third 1.8 *(2.9)* fourth 2.2 *(3.5)* fifth 2.9 *(4.7)* sixth 3.6 *(5.7)* seventh 4.0 *(6.4)* eighth 4.6 *(7.5)* ninth 4.8 *(7.7)* tenth 5.6 *(9.0)* eleventh 6.0 *(9.7)* twelfth 7.3 *(11.7)* thirteenth 9.8 *(15.7)* fourteenth 11.8 *(19.0)* fifteenth 13.2 *(21.3)* sixteenth 15.9 *(25.6)* reverse 2.1 *(3.4)*, 2.5 *(4.1)*, 2.7 *(4.4)*, 3.3 *(5.3)*, 4.4 *(7.1)*, 5.3 *(8.6)*, 6.0 *(9.6)*, 7.2 *(11.6)* **Clutch** single plate dry disc operated by foot pedal **Brakes** single wet disc hydraulically actuated and operated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 122" *(3.10 m)* left 122" *(3.10 m)* (on concrete surface without brake) right 138.4" *(3.52m)* left 138.4" *(3.52 m)* **Turning space diameter** (on concrete surface with brake applied) right 254.5" *(6.46 m)* left 254.5" *(6.46 m)* (on concrete surface without brake) right 282" *(7.16 m)* left 282" *(7.16 m)* **Power take-off** 1000 rpm at 2190 engine rpm and 540 rpm at 2142 engine rpm.

LUGGING ABILITY IN 11th (2HiTA) GEAR

Crankshaft Speed rpm	2401	2161	1919	1683	1441	1202
Pull—lbs *(kN)*	4429 *(19.70)*	4811 *(21.40)*	5036 *(22.40)*	5211 *(23.18)*	5248 *(23.34)*	5017 *(22.32)*
Increase in Pull %	0	9	14	18	18	13
Power—Hp *(kW)*	65.39 *(48.76)*	63.64 *(47.46)*	58.93 *(43.94)*	53.36 *(39.79)*	45.92 *(34.24)*	36.73 *(27.39)*
Speed—Mph *(km/h)*	5.54 *(8.91)*	4.96 *(7.98)*	4.39 *(7.06)*	3.84 *(6.18)*	3.28 *(5.28)*	2.75 *(4.42)*
Slip %	5.38	5.89	6.15	6.28	6.53	6.15

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)
Maximum Available Power—Two Hours	98.0
75% of Pull at Maximum Power—Ten Hours	99.0
50% of Pull at Maximum Power—Two Hours	98.5
50% of Pull at Reduced Engine Speed—Two Hours	94.5
Bystander in 16th (4HiDD) gear	88.5

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi *(kPa)*	Two 18.4-30; 6; 16 *(110)*	Two 18.4-30; 6; 16 *(110)*
Ballast	—Liquid (each)	1096 lb *(497 kg)*	None
	—Cast Iron (each)	857 lb *(389 kg)*	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 9.5L-16; 6; 36 *(250)*	Two 9.5L-16; 6; 36 *(250)*
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	20 lb *(9 kg)*	None
Height of Drawbar		16.5 in *(420 mm)*	16.5 in *(420 mm)*
Static Weight with Operator	—Rear	8130 lb *(3688 kg)*	4225 lb *(1916 kg)*
	Front	2020 lb *(916 kg)*	1980 lb *(898 kg)*
	Total	10150 lb *(4604 kg)*	6205 lb *(2814 kg)*

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump return was 145°F *(62.9°C)*. Nine gears were chosen between tire tangential pull limit and 10 mph *(16.1 km/h)*.

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1376.**

LOUIS I. LEVITICUS
Engineer-in-Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

International 884 Rowcrop Diesel

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Roy G. Arnold, Director

NEBRASKA TRACTOR TEST 1377 — INTERNATIONAL 3788 DIESEL 12 SPEED

POWER TAKE-OFF PERFORMANCE

	Power Hp *(kW)*	Crank shaft speed rpm	Fuel Consumption			Temperature °F *(°C)*			Barometer inch Hg *(kPa)*
			gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Cooling medium	Air wet bulb	Air dry bulb	
MAXIMUM POWER AND FUEL CONSUMPTION									
Rated Engine Speed—Two Hou **(PTO Speed—1207 rpm)**									
	170.57 *(127.19)*	2500	10.928 *(41.367)*	0.447 *(0.272)*	15.61 *(3.075)*	191 *(88.4)*	55 *(12.7)*	75 *(23.9)*	29.157 *(98.458)*
Standard Power Take-off Speed (1000 rpm)—One Hour									
	166.39 *(124.08)*	2071	9.718 *(36.787)*	0.408 *(0.248)*	17.12 *(3.373)*	193 *(89.4)*	55 *(12.8)*	75 *(23.9)*	29.125 *(98.351)*
VARYING POWER AND FUEL CONSUMPTION—Two Hours									
	149.46 *(111.45)*	2575	10.037 *(37.994)*	0.469 *(0.285)*	14.89 *(2.933)*	189 *(87.2)*	55 *(12.8)*	75 *(23.9)*	....
	0.00 *(0.00)*	2752	3.667 *(13.881)*	....	....	182 *(83.3)*	55 *(12.8)*	75 *(23.9)*	....
	77.37 *(57.69)*	2672	6.788 *(25.695)*	0.612 *(0.372)*	11.40 *(2.245)*	184 *(84.4)*	56 *(13.1)*	76 *(24.2)*	....
	170.70 *(127.29)*	2500	10.961 *(41.492)*	0.448 *(0.273)*	15.57 *(3.068)*	192 *(88.9)*	55 *(12.8)*	75 *(23.6)*	....
	39.39 *(29.37)*	2720	5.244 *(19.851)*	0.929 *(0.565)*	7.51 *(1.480)*	183 *(83.6)*	55 *(12.8)*	75 *(23.9)*	....
	114.17 *(85.14)*	2628	8.391 *(31.763)*	0.513 *(0.312)*	13.61 *(2.680)*	187 *(85.8)*	55 *(12.5)*	75 *(23.6)*	....
Av ***Av***	**91.85** ***(68.49)***	**2641**	**7.515** ***(28.447)***	**0.571** ***(0.347)***	**12.22** ***(2.408)***	**186** ***(85.6)***	**55** ***(12.8)***	**75** ***(23.8)***	**29.097** ***(98.255)***

DRAWBAR PERFORMANCE

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption			Temp. °F *(°C)*			Barom. inch Hg *(kPa)*
					gal/hr *(l/h)*	lb/hp.hr *(kg/kjw.h)*	Hp.hr/gal *(kW.h/l)*	Cool-ing med	Air wet bulb	Air dry bulb	
Maximum Available Power—Two Hours 6th (3LoDD) Gear											
142.05 *(105.93)*	8635 *(38.41)*	6.17 *(9.93)*	2499	1.49	10.729 *(40.612)*	0.527 *(0.321)*	13.24 *(2.608)*	186 *(85.6)*	48 *(8.6)*	56 *(13.1)*	29.035 *(98.047)*
75% of Pull at Maximum Power—Ten Hours 6th (3LoDD) Gear											
114.49 *(85.37)*	6653 *(29.59)*	6.45 *(10.39)*	2603	1.14	9.349 *(35.392)*	0.570 *(0.347)*	12.25 *(2.412)*	186 *(85.7)*	57 *(13.7)*	66 *(18.9)*	28.825 *(97.338)*
50% of Pull at Maximum Power—Two Hours 6th (3LoDD) Gear											
78.01 *(58.18)*	4430 *(19.71)*	6.60 *(10.63)*	2663	1.14	7.755 *(29.357)*	0.694 *(0.422)*	10.06 *(1.982)*	182 *(83.3)*	39 *(3.6)*	39 *(3.9)*	28.965 *(97.810)*
50% of Pull at Reduced Engine Speed—Two Hours 8th (1HiDD) Gear											
77.45 *(57.75)*	4412 *(19.63)*	6.58 *(10.59)*	1874	1.05	5.928 *(22.442)*	0.534 *(0.325)*	13.06 *(2.573)*	181 *(82.8)*	37 *(2.8)*	38 *(3.1)*	29.020 *(97.996)*
MAXIMUM POWER IN SELECTED GEARS											
138.35 *(103.16)*	19069 *(84.83)*	2.72 *(4.38)*	2536	6.91	2nd (1LoDD) Gear			184 *(84.2)*	31 *(-0.5)*	34 *(1.1)*	29.170 *(98.503)*
143.22 *(106.80)*	14047 *(62.48)*	3.82 *(6.15)*	2500	2.92	3rd (2LoTA) Gear			186 *(85.3)*	46 *(7.8)*	53 *(11.7)*	29.060 *(98.131)*
144.40 *(107.68)*	12020 *(53.47)*	4.51 *(7.25)*	2500	2.14	4th (2LoDD) Gear			186 *(85.6)*	46 *(7.8)*	53 *(11.7)*	29.060 *(98.131)*
145.52 *(108.51)*	10386 *(46.20)*	5.25 *(8.46)*	2498	1.80	5th (3LoTA) Gear			186 *(85.3)*	45 *(7.2)*	52 *(11.1)*	29.080 *(98.199)*
145.66 *(108.62)*	8860 *(39.41)*	6.17 *(9.92)*	2497	1.54	6th (3LoDD) Gear			186 *(85.3)*	44 *(6.7)*	51 *(10.6)*	29.100 *(98.266)*
146.43 *(109.19)*	7331 *(32.61)*	7.49 *(12.05)*	2498	1.27	7th (1HiTA) Gear			186 *(85.6)*	47 *(8.3)*	54 *(12.2)*	29.050 *(98.097)*
145.24 *(108.31)*	6199 *(27.58)*	8.79 *(14.14)*	2500	1.10	8th (1HiDD) Gear			186 *(85.6)*	47 *(8.3)*	54 *(12.2)*	29.050 *(98.097)*

Department of Agricultural Engineering

Dates of Test: November 5-17, 1980

MANUFACTURER: INTERNATIONAL HARVESTER COMPANY, 401 North Michigan Avenue, Chicago, IL 60611.

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 47.9 (rating taken from oil company's inspection data) **Specific gravity corverted to 60°/60°** *(15°/15°)* 0.8382 **Fuel weight** 6.979 lbs/gal *(0.836 kg/l)* **Oil SAE** 30 **API service classification** CA/CD-SC/SE **To motor** 3.852 gal *(14.580 l)* **Drained from motor** 3.430 gal *(12.984 l)* **Transmission and final drive lubricant** I.H. Hytran fluid **Total time engine was operated** 38.0 hours

ENGINE Make International Diesel **Type** six cylinder vertical with turbocharger **Serial No.** 467TT2U123651* **Crankshaft** lengthwise **Rated rpm** 2500 **Bore and stroke** 4.300" × 5.350" *(109.2 mm × 135.9 mm)* **Compression ratio** 16.3 to 1 **Displacement** 466 cu in *(7639 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements with aspirator **Oil filter** two paper cartridges **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** three paper cartridges **Muffler** underhood **Exhaust** vertical **Cooling medium temperature control** one thermostat

CHASSIS: Type four wheel drive **Serial No.** 290000IU 9347* **Tread width** rear 62.4" *(1585 mm)* to 115" *(2921 mm)* front 62.4" *(1585 mm)* to 115" *(2921 mm)* **Wheel base** 110" *(2794 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 58.6" *(1488 mm)* Vertical distance above roadway 42.2" *(1072 mm)* Horizontal distance from center of rear wheel tread 0" *(0 mm)* to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial (2) range operator controlled powershift **Advertised speeds mph** ***(km/h)*** first 2.3 *(3.6)* second 2.6 *(4.2)* third 3.6 *(5.8)* fourth 4.2 *(6.8)* fifth 4.9 *(7.9)* sixth 5.7 *(9.2)* seventh 6.9 *(11.2)* eighth 8.1 *(13.0)* ninth 11.1 *(17.9)* tenth 13.0 *(20.9)* eleventh 15.1 *(24.3)* twelfth 17.7 *(28.4)* reverse 3.9 *(6.2)*, 4.5 *(7.3)*, 6.2 *(9.9)*, 7.2 *(11.6)*, 8.4 *(13.5)*, 9.8 *(15.8)* **Clutch** dry single disc hydraulically power actuated and operated by foot pedal **Brakes** wet multiple disc hydraulically activated and operated by foot pedal **Steering** hydrostatic and articulated **Turning radius** (on concrete surface without brake) right 222" *(5.64 m)* left 222" *(5.64 m)* **Turning space diameter** (on concrete surface without brake) right 477" *(12.12 m)* left 477" *(12.12 m)* **Power take-off** 1000 rpm at 2071 engine rpm.

LUGGING ABILITY IN 6th (3LoDD) GEAR

Crankshaft Speed rpm	2497	2248	2000	1753	1497	1249
Pull—lbs *(kN)*	8860 *(39.41)*	10159 *(45.19)*	10767 *(47.90)*	11360 *(50.53)*	10698 *(47.59)*	9984 *(44.41)*
Increase in Pull %	0	15	22	28	21	13
Power—Hp *(kW)*	145.66 *(108.62)*	150.02 *(111.87)*	141.16 *(105.26)*	130.31 *(97.17)*	105.01 *(78.30)*	81.86 *(61.04)*
Speed—Mph *(km/h)*	6.17 *(9.92)*	5.54 *(8.91)*	4.92 *(7.91)*	4.30 *(6.92)*	3.68 *(5.92)*	3.07 *(4.95)*
Slip %	1.54	1.71	1.88	2.06	1.88	1.88

TRACTOR SOUND LEVEL WITH CAB	dB(A)
Maximum Available Power—Two Hours	80.5
75% of Pull at Maximum Power—Ten Hours	80.5
50% of Pull at Maximum Power—Two Hours	80.5
50% of Pull at Reduced Engine Speed—Two Hours	78.5
Bystander in 11th (3HiTA) gear	88.5

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi *(kPa)*	Two 20.8R38; 8; 16 *(110)*	Two 20.8R38; 8; 16 *(110)*
Ballast	—Liquid (each)	1065 lb *(483 kg)*	None
	—Cast Iron (each)	None	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 20.8R38; 8; 16 *(110)*	Two 20.8R38; 8; 16 *(110)*
*Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	35 lb *(16 kg)*	None
Height of Drawbar		15 in *(380 mm)*	15 in *(380 mm)*
Static Weight with Operator—Rear		10880 lb *(4935 kg)*	8750 lb *(3969 kg)*
Front		9940 lb *(4509 kg)*	9870 lb *(4477 kg)*
Total		20820 lb *(9444 kg)*	18620 lb *(8446 kg)*

*This ballast represents test equipment added.

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump return was 159°F *(70.4°C)*. Seven gears were chosen between 15% slip and 10 mph *(16.1 km/h)* The pull in 2nd (1LoDD) gear was limited to avoid tractor bouncing.

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1377**.

LOUIS I. LEVITICUS
Engineer-in-Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

International 3788 Diesel

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Roy G. Arnold, Director

NEBRASKA TRACTOR TEST 1378 — CASE 1190 MANUAL DIESEL 12 SPEED

POWER TAKE-OFF PERFORMANCE

	Power Hp *(kW)*	Crank shaft speed rpm	Fuel Consumption			Temperature °F *(°C)*			
			gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg *(kPa)*
	MAXIMUM POWER AND FUEL CONSUMPTION								
	Rated Engine Speed—Two Hours (PTO Speed—650 rpm)								
	43.09 *(32.13)*	2200	2.932 *(11.099)*	0.477 *(0.290)*	14.70 *(2.895)*	200 *(93.5)*	54 *(12.4)*	75 *(23.9)*	28.950 *(97.760)*
	Standard Power take-off Speed (540 rpm)—One Hour								
	38.54 *(28.74)*	1827	2.570 *(9.729)*	0.467 *(0.284)*	14.99 *(2.954)*	208 *(98.0)*	54 *(12.1)*	75 *(23.7)*	28.945 *(97.743)*
	VARYING POWER AND FUEL CONSUMPTION—Two Hours								
	37.60 *(28.04)*	2259	2.488 *(9.418)*	0.464 *(0.282)*	15.12 *(2.977)*	188 *(86.4)*	54 *(12.2)*	76 *(24.2)*	....
	0.00 *(0.00)*	2352	0.698 *(2.542)*	....	....	171 *(76.9)*	54 *(12.2)*	75 *(23.9)*	....
	19.22 *(14.33)*	2310	1.434 *(5.428)*	0.523 *(0.318)*	13.40 *(2.640)*	176 *(80.0)*	54 *(12.2)*	75 *(23.9)*	....
	42.84 *(31.95)*	2199	2.950 *(11.167)*	0.483 *(0.294)*	14.52 *(2.861)*	200 *(93.3)*	54 *(12.2)*	76 *(24.2)*	....
	9.70 *(7.23)*	2332	1.058 *(4.005)*	0.764 *(0.465)*	9.17 *(1.805)*	175 *(79.4)*	54 *(12.2)*	76 *(24.2)*	....
	28.47 *(21.23)*	2280	1.901 *(7.196)*	0.468 *(0.285)*	14.98 *(2.950)*	180 *(81.9)*	54 *(12.2)*	75 *(23.9)*	....
Av ***Av***	**22.97** ***(17.13)***	**2289**	**1.755** ***(6.643)***	**0.535** ***(0.326)***	**13.09** ***(2.579)***	**181** ***(83.0)***	**54** ***(12.2)***	**75** ***(24.1)***	**28.910** ***(97.625)***

DRAWBAR PERFORMANCE

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption			Temp. °F *(°C)*			
					gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Cool-ing med	Air wet bulb	Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power—Two Hours 8th (4-1) Gear											
34.65 *(25.84)*	2512 *(11.17)*	5.17 *(8.32)*	2200	6.88	2.836 *(10.735)*	0.574 *(0.349)*	12.22 *(2.407)*	213 *(100.6)*	59 *(15.0)*	80 *(26.7)*	28.630 *(96.680)*
75% of Pull at Maximum Power—Ten Hours 8th (4-1) Gear											
28.62 *(21.34)*	1969 *(8.76)*	5.45 *(8.77)*	2271	4.98	2.273 *(8.604)*	0.556 *(0.338)*	12.59 *(2.480)*	191 *(88.3)*	62 *(16.7)*	68 *(20.0)*	28.103 *(94.900)*
50% of Pull at Maximum Power—Two Hours 8th (4-1) Gear											
19.71 *(14.70)*	1313 *(5.84)*	5.63 *(9.06)*	2309	3.51	1.730 *(6.549)*	0.615 *(0.374)*	11.39 *(2.244)*	188 *(86.7)*	37 *(2.8)*	42 *(5.6)*	28.675 *(96.830)*
50% of Pull at Reduced Engine Speed—Two Hours 10th (3-3) Gear											
19.67 *(14.67)*	1315 *(5.85)*	5.61 *(9.03)*	1602	3.42	1.445 *(5.470)*	0.515 *(0.313)*	13.61 *(2.681)*	183 *(83.9)*	39 *(3.9)*	45 *(7.2)*	28.735 *(97.030)*
MAXIMUM POWER IN SELECTED GEARS											
33.74 *(25.16)*	4620 *(20.55)*	2.74 *(4.41)*	2246	14.67		5th (1-3) Gear		188 *(86.7)*	40 *(4.4)*	47 *(8.3)*	28.780 *(97.190)*
33.93 *(25.30)*	3980 *(17.70)*	3.20 *(5.15)*	2199	11.94		6th (2-2) Gear		205 *(96.1)*	53 *(11.7)*	67 *(19.4)*	28.660 *(96.780)*
36.08 *(26.90)*	3212 *(14.29)*	4.21 *(6.78)*	2199	8.82		7th (3-2) Gear		203 *(95.0)*	53 *(11.7)*	66 *(18.9)*	28.660 *(96.780)*
36.21 *(27.00)*	2632 *(11.71)*	5.16 *(8.30)*	2200	7.07		8th (4-1) Gear		201 *(93.9)*	52 *(11.1)*	65 *(18.3)*	28.670 *(96.810)*
35.89 *(26.76)*	2285 *(10.16)*	5.89 *(9.48)*	2200	5.98		9th (2-3) Gear		203 *(95.0)*	53 *(11.7)*	69 *(20.6)*	28.660 *(96.780)*
36.60 *(27.29)*	1807 *(8.04)*	7.60 *(12.23)*	2200	4.69		10th (3-3) Gear		203 *(95.0)*	54 *(12.2)*	71 *(21.7)*	28.660 *(96.780)*
35.60 *(26.55)*	1510 *(6.72)*	8.84 *(14.23)*	2197	3.94		11th (4-2) Gear		203 *(95.0)*	55 *(12.8)*	73 *(22.8)*	28.660 *(96.780)*

Department of Agricultural Engineering

Dates of Test: March 27 to April 9, 1981

Manufacturer: J. I. CASE COMPANY, Racine, Wisconsin 53404

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 46.3 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60°** ***(15°/15°)*** 0.8416 **Fuel weight** 7.007 lbs/gal *(0.840 kg/l)* **Oil SAE** 30 **API service classification** CD-SE **To motor** 1.658 gal *(6.276 l)* **Drained from motor** 1.470 gal *(5.565 l)* **Transmission lubricant** Case TFD fluid **Final drive lubricant** Case ETHB fluid **Total time engine was operated** 38.0 hours

ENGINE Make Case Diesel **Type** three cylinder vertical **Serial No.** 16500311310852 **Crankshaft** lengthwise **Rated rpm** 2200 **Bore and stroke** 3.939" × 4.500" *(100 mm × 114.3 mm)* **Compression ratio** 17 to 1 **Displacement** 165 cu in *(2705 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements with centrifugal precleaner **Oil filter** one full flow cartridge **Fuel filter** two paper elements with sediment bowl and screen **Muffler** vertical **Cooling medium temperature control** one thermostat.

CHASSIS: Type standard **Serial No.** 1190/00/11030782 **Tread width** rear 56" *(1422 mm)* to 76" *(1930 mm)* front 52" *(1321 mm)* to 72" *(1829 mm)* **Wheel base** 77" *(1956 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 28.5" *(724 mm)* Vertical distance above roadway 28.8" *(732 mm)* Horizontal distance from center of rear wheel tread 0" *(0 mm)* to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph *(km/h)*** first 1.1 *(1.8)* second 1.8 *(2.9)* third 2.2 *(3.5)* fourth 2.8 *(4.5)* fifth 3.2 *(5.1)* sixth 3.7 *(5.9)* seventh 4.7 *(7.5)* eighth 5.6 *(9.0)* ninth 6.3 *(10.2)* tenth 8.1 *(13.0)* eleventh 9.3 *(15.0)* twelfth 16.1 *(25.9)* reverse 1.8 *(2.9)*, 3.6 *(5.9)*, 4.6 *(7.3)*, 9.2 *(14.6)* **Clutch** single dry disc in combination with PTO clutch operated by foot pedal **Brakes** drum and shoe operated by two foot pedals which can be locked together and hand lever **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 114" *(2.90 m)* left 114" *(2.90 m)* (on concrete surface without brake) right 128" *(3.25 m)* left 128" *(3.25 m)* **Turning space diameter** (on concrete surface with brake applied) right 236" *(5.99 m)* left 236" *(5.99 m)* (on concrete surface without brake) right 264" *(6.71 m)* left 264" *(6.71 m)* **Power take-off** 540 rpm at 1827 engine rpm.

LUGGING ABILITY IN 8th (4-1) GEAR

Crankshaft Speed rpm	2200	1978	1757	1548	1311	1090
Pull—lbs *(kN)*	2632 *(11.71)*	2801 *(12.46)*	2944 *(13.10)*	3007 *(13.38)*	2977 *(13.24)*	2801 *(12.46)*
Increase in Pull %	0	6	12	14	13	6
Power—Hp *(kW)*	36.21 *(27.00)*	34.51 *(25.73)*	32.06 *(23.91)*	28.82 *(21.49)*	24.15 *(18.01)*	19.01 *(14.18)*
Speed—Mph *(km/h)*	5.16 *(8.30)*	4.62 *(7.44)*	4.08 *(6.57)*	3.59 *(5.78)*	3.04 *(4.89)*	2.54 *(4.09)*
Slip %	7.07	7.56	7.88	7.98	8.19	7.66

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)
Maximum Available Power—Two Hours	97.5
75% of Pull at Maximum Power—Ten Hours	94.5
50% of Pull at Maximum Power—Two Hours	93.0
50% of Pull at Reduced Engine Speed—Two Hours	91.0
Bystander in 12th (4-3) gear	85.5

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi *(kPa)*	Two 13.6-28; 6; 20 *(140)*	Two 13.6-28; 6; 20 *(140)*
Ballast	—Liquid (each)	470 lb *(213 kg)*	None
	—Cast Iron (each)	605 lb *(274 kg)*	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 6:00-16; 6; 32 *(220)*	Two 6:00-16; 6; 32 *(220)*
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	5 lb *(2 kg)*	None
Height of drawbar		17.5 in *(445 mm)*	17.5 in *(445 mm)*
Static Weight with Operator	—Rear	5060 lb *(2295 kg)*	2910 lb *(1320 kg)*
	Front	1720 lb *(780 kg)*	1710 lb *(776 kg)*
	Total	6780 lb *(3075 kg)*	4620 lb *(2096 kg)*

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump was 134°F *(56.7°C)*. Seven gears were chosen between 15% slip and 10 mph *(16.1 km/h)*.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1378.**

LOUIS I. LEVITICUS
Engineer-in Charge

K. VON BARGEN
W. E. SPLINTER
L. L. BASHFORD
Board of Tractor Test Engineers

Case 1190 Manual Diesel

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Roy G. Arnold, Director

NEBRASKA TRACTOR TEST 1379 — CASE 1290 MANUAL DIESEL 12 SPEED

POWER TAKE-OFF PERFORMANCE

	Power Hp *(kW)*	Crank shaft speed rpm	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temperature °F *(°C)* Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg *(kPa)*
MAXIMUM POWER AND FUEL CONSUMPTION									
Rated Engine Speed—Two Hours (PTO Speed—650 rpm)									
	53.73 *(40.07)*	2200	3.617 *(13.792)*	0.472 *(0.287)*	14.86 *(2.927)*	187 *(86.3)*	56 *(13.4)*	75 *(23.7)*	29.043 *(98.075)*
Standard Power take-off Speed (540 rpm)—One Hour									
	47.80 *(35.64)*	1827	3.144 *(11.901)*	0.462 *(0.281)*	15.20 *(2.995)*	195 *(90.6)*	57 *(13.8)*	75 *(24.1)*	29.040 *(98.064)*
VARYING POWER AND FUEL CONSUMPTION—Two Hours									
	47.42 *(35.36)*	2286	3.078 *(11.651)*	0.456 *(0.277)*	15.41 *(3.035)*	179 *(81.7)*	55 *(12.5)*	74 *(23.3)*	....
	0.00 *(0.00)*	2362	0.864 *(3.271)*	....	....	162 *(72.2)*	54 *(12.2)*	74 *(23.1)*	....
	24.04 *(17.93)*	2318	1.791 *(6.780)*	0.523 *(0.318)*	13.42 *(2.645)*	164 *(73.3)*	54 *(12.2)*	75 *(23.6)*	....
	53.84 *(40.15)*	2200	3.621 *(13.707)*	0.472 *(0.287)*	14.87 *(2.929)*	187 *(86.1)*	54 *(12.2)*	75 *(23.9)*	....
	12.16 *(9.07)*	2341	1.308 *(4.951)*	0.755 *(0.459)*	9.29 *(1.832)*	164 *(73.1)*	54 *(12.2)*	75 *(23.9)*	....
	35.76 *(26.67)*	2296	2.322 *(8.790)*	0.456 *(0.277)*	15.41 *(3.034)*	174 *(78.9)*	54 *(12.2)*	75 *(23.9)*	....
Av **Av**	**28.87** ***(21.53)***	**2300**	**2.164** ***(8.192)***	**0.526** ***(0.320)***	**13.34** ***(2.628)***	**172** ***(77.6)***	**54** ***(12.3)***	**75** ***(23.6)***	**29.010** ***(97.962)***

DRAWBAR PERFORMANCE
(Front Wheel Drive Disengaged)

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temp. °F *(°C)* Cool-ing med	Air wet bulb	Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power—Two Hours 8th (4-1) Gear											
44.66 *(33.30)*	3367 *(14.98)*	4.98 *(8.01)*	2200	5.12	3.598 *(13.620)*	0.565 *(0.344)*	12.41 *(2.445)*	195 *(90.6)*	56 *(13.3)*	70 *(21.1)*	28.465 *(96.120)*
75% of Pull at Maximum Power—Ten Hours 8th (4-1) Gear											
37.14 *(27.70)*	2637 *(11.73)*	5.28 *(8.50)*	2301	3.72	2.879 *(10.898)*	0.544 *(0.331)*	12.90 *(2.542)*	178 *(81.1)*	47 *(8.3)*	57 *(13.9)*	28.533 *(96.350)*
50% of Pull at Maximum Power—Two Hours 8th (4-1) Gear											
25.17 *(18.77)*	1754 *(7.80)*	5.38 *(8.66)*	2316	2.58	2.155 *(8.158)*	0.600 *(0.365)*	11.68 *(2.301)*	173 *(78.3)*	49 *(9.4)*	63 *(17.2)*	28.955 *(97.780)*
50% of Pull at Reduced Engine Speed—Two Hours 10th (3-3) Gear											
25.21 *(18.80)*	1750 *(7.78)*	5.40 *(8.69)*	1617	2.38	1.728 *(6.541)*	0.481 *(0.293)*	14.59 *(2.874)*	180 *(82.2)*	52 *(10.8)*	69 *(20.3)*	28.945 *(97.740)*
MAXIMUM POWER IN SELECTED GEARS											
43.07 *(32.12)*	6851 *(30.47)*	2.36 *(3.80)*	2260	12.73		4th (3-1) Gear		181 *(82.8)*	44 *(6.7)*	53 *(11.7)*	28.960 *(97.790)*
43.36 *(32.33)*	6163 *(27.41)*	2.64 *(4.25)*	2199	10.92		5th (1-3) Gear		186 *(85.6)*	51 *(10.6)*	60 *(15.6)*	28.520 *(96.310)*
44.03 *(32.83)*	5270 *(23.44)*	3.13 *(5.04)*	2200	8.51		6th (2-2) Gear		191 *(88.3)*	50 *(10.0)*	58 *(14.4)*	28.520 *(96.310)*
46.14 *(34.41)*	4236 *(18.84)*	4.08 *(6.57)*	2200	6.34		7th (3-2) Gear		190 *(87.8)*	49 *(9.4)*	56 *(13.3)*	28.520 *(96.310)*
46.41 *(34.61)*	3500 *(15.57)*	4.97 *(8.00)*	2200	5.27		8th (4-1) Gear		183 *(83.9)*	44 *(6.7)*	49 *(9.4)*	28.520 *(96.310)*
44.64 *(33.29)*	2958 *(13.16)*	5.66 *(9.11)*	2200	4.38		9th (2-3) Gear		192 *(88.9)*	52 *(11.1)*	62 *(16.7)*	28.510 *(96.270)*
45.34 *(33.81)*	2333 *(10.38)*	7.29 *(11.73)*	2202	3.27		10th (3-3) Gear		192 *(88.9)*	53 *(11.7)*	63 *(17.2)*	28.520 *(96.310)*
44.17 *(32.94)*	1959 *(8.71)*	8.46 *(13.62)*	2198	2.61		11th (4-2) Gear		193 *(89.4)*	54 *(12.2)*	65 *(18.3)*	28.480 *(96.170)*

Department of Agricultural Engineering

Dates of Test: March 18 to April 13, 1981

Manufacturer: J. I. CASE COMPANY, Racine, Wisconsin 53404

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 46.3 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60° *(15°/15°)*** 0.8428 **Fuel weight** 7.017 lbs/gal *(0.841 kg/l)* **Oil SAE** 30 **API service classification** CD-SE **To motor** 2.188 gal *(8.282 l)* **Drained from motor** 1.772 gal *(6.708 l)* **Transmission lubricant** Case TFD fluid **Final drive lubricant** Case ETHB fluid **Front axle lubricant** Case FDL SAE 90 **Total time engine was operated** 44.5 hours

ENGINE Make Case Diesel **Type** four cylinder vertical **Serial No.** 195002 11340667 **Crankshaft** lengthwise **Rated rpm** 2200 **Bore and stroke** 3.939" × 4.000" *(100 mm × 101.6 mm)* **Compression ratio** 17 to 1 **Displacement** 195 cu in *(3197 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements with centrifugal precleaner **Oil filter** one full flow cartridge **Fuel filter** two paper cartridges with sediment bowl and screen **Muffler** vertical **Cooling medium temperature control** one thermostat.

CHASSIS: Type front wheel assist **Serial No.** 1290/18/11050714 **Tread width** rear 56" *(1422 mm)* to 84" *(2134 mm)* front 60" *(1524 mm)* to 72" *(1829 mm)* **Wheel base** 84" *(2134 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 36.4" *(925 mm)* Vertical distance above roadway 30.4" *(772 mm)* Horizontal distance from center of rear wheel tread 0" *(0 mm)* to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph *(km/h)*** first 1.0 *(1.7)* second 1.7 *(2.8)* third 2.1 *(3.3)* fourth 2.6 *(4.2)* fifth 3.0 *(4.8)* sixth 3.4 *(5.5)* seventh 4.3 *(7.0)* eighth 5.2 *(8.4)* ninth 5.9 *(9.5)* tenth 7.5 *(12.0)* eleventh 8.7 *(14.0)* twelfth 15.0 *(24.0)* reverse 1.7 *(2.7)*, 3.4 *(5.4)*, 4.3 *(6.9)*, 8.6 *(13.8)* **Clutch** single dry disc operated by foot pedal **Brakes** drum and shoe operated by two foot pedals which can be locked together and hand lever **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 138" *(3.51 m)* left 138" *(3.51 m)* (on concrete surface without brake) right 178" *(4.52 m)* left 178" *(4.52 m)* **Turning space diameter** (on concrete surface with brake applied) right 296" *(7.52 m)* left 296" *(7.52 m)* (on concrete surface without brake) right 372" *(9.45 m)* left 372" *(9.45 m)* **Power take-off** 540 rpm at 1827 engine rpm.

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

LUGGING ABILITY IN 8th (4-1) GEAR

Crankshaft Speed rpm	2200	1984	1756	1536	1318	1094
Pull—lbs *(kN)*	3500 *(15.57)*	3659 *(16.28)*	3778 *(16.81)*	3862 *(17.18)*	3810 *(16.95)*	3602 *(16.02)*
Increase in Pull %	0	5	8	10	9	3
Power—Hp *(kW)*	46.41 *(34.61)*	43.65 *(32.55)*	39.79 *(29.67)*	35.53 *(26.49)*	30.08 *(22.43)*	23.70 *(17.67)*
Speed—Mph *(km/h)*	4.97 *(8.00)*	4.47 *(7.19)*	3.95 *(6.36)*	3.45 *(5.55)*	2.96 *(4.76)*	2.47 *(3.98)*
Slip %	5.27	5.46	5.59	5.84	5.71	5.31

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)	Front Wheel Drive Disengaged dB(A)
Maximum Available Power—Two Hours	98.5	98.0
75% of Pull at Maximum Power—Ten Hours		97.5
50% of Pull at Maximum Power—Two Hours		95.5
50% of Pull at Reduced Engine Speed—Two Hours		93.5
Bystander in 12th (4-3) gear		90.0

DRAWBAR PERFORMANCE
(Front Wheel Drive Engaged)

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temp. °F *(°C)* Cool-ing med	Air wet bulb	Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power—Two Hours 8th (4-1) Gear											
44.81 *(33.41)*	3288 *(14.63)*	5.11 *(8.22)*	2200	3.88	3.527 *(13.351)*	0.552 *(0.336)*	12.70 *(2.502)*	197 *(91.7)*	57 *(13.9)*	75 *(23.9)*	28.420 *(95.970)*
MAXIMUM POWER IN SELECTED GEARS											
41.32 *(30.81)*	8445 *(37.57)*	1.84 *(2.96)*	2264	14.62	3rd (2-1) Gear			174 *(78.9)*	40 *(4.4)*	47 *(8.3)*	28.940 *(97.730)*
46.44 *(34.63)*	4160 *(18.50)*	4.19 *(6.74)*	2201	5.15	7th (3-2) Gear			190 *(87.8)*	48 *(8.9)*	55 *(12.8)*	28.520 *(96.310)*
45.89 *(34.22)*	3381 *(15.04)*	5.09 *(8.19)*	2200	4.18	8th (4-1) Gear			189 *(87.2)*	47 *(8.3)*	53 *(11.7)*	28.520 *(96.310)*

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi *(kPa)*	Two 16.9/14-30; 6; 16 *(110)*	Two 16.9/14-30; 6; 16 *(110)*
Ballast	—Liquid (each)	620 lb *(281 kg)*	None
	—Cast Iron (each)	722 lb *(327 kg)*	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 9.5-24; 6; 24 *(165)*	Two 9.5-24; 6; 24 *(165)*
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	33 lb *(15 kg)*	None
Height of drawbar		18 in *(455 mm)*	18 in *(455 mm)*
Static Weight with Operator	—Rear	6500 lb *(2948 kg)*	3815 lb *(1731 kg)*
	Front	2820 lb *(1279 kg)*	2755 lb *(1250 kg)*
	Total	9320 lb *(4227 kg)*	6570 lb *(2981 kg)*

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump was 157°F *(69.3°C)*. Eight gears were chosen between tire tangential pull limit (front wheel disengaged), 15% slip (front wheel drive engaged), and 10 mph *(16.1 km/h)*.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1379.**

LOUIS I. LEVITICUS
Engineer-in Charge

K. VON BARGEN
W. E. SPLINTER
L. L. BASHFORD
Board of Tractor Test Engineers

Case 1290 Manual Diesel

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Roy G. Arnold, Director

NEBRASKA TRACTOR TEST 1380 — CASE 1390 MANUAL DIESEL 12 SPEED

POWER TAKE-OFF PERFORMANCE

	Power Hp *(kW)*	Crank shaft speed rpm	Fuel Consumption gal/hr *(l/h)*	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Fuel Consumption Hp.hr/gal *(kW.h/l)*	Temperature °F *(°C)* Cooling medium	Temperature °F *(°C)* Air wet bulb	Temperature °F *(°C)* Air dry bulb	Barometer inch Hg *(kPa)*
MAXIMUM POWER AND FUEL CONSUMPTION									
Rated Engine Speed—Two Hours (PTO Speed—1075 rpm)									
	60.59 *(45.18)*	2200	3.969 *(15.024)*	0.459 *(0.279)*	15.27 *(3.007)*	212 *(99.9)*	58 *(14.5)*	75 *(24.0)*	28.785 *(97.203)*
Standard Power Take-off Speed (1000 rpm)—One Hour									
	58.40 *(43.55)*	2047	3.748 *(14.188)*	0.450 *(0.274)*	15.58 *(3.069)*	213 *(100.8)*	58 *(14.4)*	75 *(23.9)*	28.760 *(97.118)*
VARYING POWER AND FUEL CONSUMPTION—Two Hours									
	53.65 *(40.01)*	2293	3.468 *(13.128)*	0.453 *(0.276)*	15.47 *(3.048)*	196 *(90.8)*	58 *(14.4)*	75 *(23.[illegible])*	....
	0.00 *(0.00)*	2360	1.028 *(3.891)*	....	....	171 *(77.2)*	58 *(14.2)*	75 *(23.6)*	....
	27.09 *(20.20)*	2314	2.012 *(7.616)*	0.520 *(0.317)*	13.46 *(2.652)*	176 *(80.0)*	58 *(14.4)*	75 *(23.9)*	....
	60.59 *(45.18)*	2200	3.977 *(15.055)*	0.460 *(0.280)*	15.24 *(3.001)*	210 *(98.6)*	58 *(14.4)*	76 *(24.2)*	....
	13.69 *(10.21)*	2342	1.494 *(5.655)*	0.765 *(0.465)*	9.16 *(1.805)*	173 *(78.1)*	58 *(14.4)*	76 *(24.2)*	....
	40.16 *(29.95)*	2288	2.633 *(9.967)*	0.460 *(0.280)*	15.25 *(3.005)*	179 *(81.4)*	58 *(14.2)*	75 *(23.6)*	....
Av ***Av***	**32.53** ***(24.26)***	**2300**	**2.435** ***(9.217)***	**0.525** ***(0.319)***	**13.36** ***(2.632)***	**184** ***(84.3)***	**58** ***(14.3)***	**75** ***(23.9)***	**28.770** ***(96.139)***

DRAWBAR PERFORMANCE (Front Wheel Drive Disengaged)

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr *(l/h)*	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Fuel Consumption Hp.hr/gal *(kW.h/l)*	Temp. °F *(°C)* Cool-ing med	Temp. °F *(°C)* Air wet bulb	Temp. °F *(°C)* Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power—Two Hours 8th (4-1) Gear											
50.38 *(37.57)*	3834 *(17.05)*	4.93 *(7.93)*	2200	6.10	3.907 *(14.789)*	0.543 *(0.331)*	12.89 *(2.541)*	208 *(97.5)*	51 *(10.6)*	69 *(20.6)*	28.810 *(97.290)*
75% of Pull at Maximum Power—Ten Hours 8th (4-1) Gear											
41.23 *(30.75)*	2978 *(13.25)*	5.19 *(8.35)*	2275	4.31	3.115 *(11.792)*	0.529 *(0.322)*	13.24 *(2.608)*	186 *(85.6)*	53 *(11.7)*	66 *(18.9)*	28.600 *(96.570)*
50% of Pull at Maximum Power—Two Hours 8th (4-1) Gear											
28.35 *(21.14)*	1988 *(8.84)*	5.35 *(8.61)*	2314	3.02	2.408 *(9.115)*	0.595 *(0.362)*	11.77 *(2.319)*	181 *(82.8)*	50 *(10.0)*	58 *(14.4)*	28.750 *(97.080)*
50% of Pull at Reduced Engine Speed—Two Hours 10th (3-3) Gear											
28.27 *(21.08)*	1981 *(8.81)*	5.35 *(8.61)*	1610	2.88	1.962 *(7.428)*	0.486 *(0.296)*	14.40 *(2.838)*	182 *(83.3)*	52 *(10.8)*	64 *(17.5)*	28.790 *(97.220)*
MAXIMUM POWER IN SELECTED GEARS											
45.36 *(33.82)*	7348 *(32.69)*	2.31 *(3.72)*	2254	14.19		4th (3-1) Gear		181 *(82.8)*	45 *(7.2)*	50 *(10.0)*	28.690 *(96.880)*
48.67 *(36.29)*	7131 *(31.72)*	2.56 *(4.12)*	2200	13.72		5th (1-3) Gear		177 *(80.6)*	46 *(7.8)*	52 *(11.1)*	28.700 *(96.920)*
49.39 *(36.83)*	6033 *(26.84)*	3.07 *(4.94)*	2200	10.39		6th (2-2) Gear		194 *(90.0)*	48 *(8.9)*	62 *(16.7)*	28.940 *(97.730)*
51.61 *(38.49)*	4800 *(21.35)*	4.03 *(6.49)*	2200	7.59		7th (3-2) Gear		191 *(88.3)*	48 *(8.9)*	61 *(16.1)*	28.950 *(97.760)*
52.16 *(38.90)*	3974 *(17.68)*	4.92 *(7.92)*	2200	6.19		8th (4-1) Gear		182 *(83.3)*	44 *(6.7)*	55 *(12.8)*	28.990 *(97.890)*
50.92 *(37.97)*	3407 *(15.16)*	5.60 *(9.02)*	2198	[illegible].19		9th (2-3) Gear		198 *(92.2)*	48 *(8.9)*	63 *(17.2)*	28.930 *(97.690)*
51.97 *(38.75)*	2696 *(11.99)*	7.23 *(11.64)*	2200	3.97		10th (3-3) Gear		198 *(92.2)*	49 *(9.4)*	65 *(18.3)*	28.920 *(97.660)*
50.49 *(37.65)*	2250 *(10.01)*	8.42 *(13.55)*	2200	3.31		11th (4-2) Gear		201 *(93.9)*	50 *(10.0)*	67 *(19.4)*	28.900 *(97.590)*

Department of Agricultural Engineering

Dates of Test: March 25 to April 10, 1980

Manufacturer: J. I. CASE COMPANY, Racine, Wisconsin 53404

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 46.3 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60°** *(15°/15°)* 0.8416 **Fuel weight** 7.007 lbs/gal *(0.840 kg/l)* **Oil SAE** 30 **API service classification** CD-SE **To motor** 1.789 gal *(6.772 l)* **Drained from motor** 1.496 gal *(5.663 l)* **Transmission lubricant** Case TFD fluid **Final drive lubricant** Case ETHB fluid **Front axle lubricant** Case FDL SAE 90 **Total time engine was operated** 38.0 hours

ENGINE Make Case Diesel **Type** four cylinder vertical **Serial No.** 220002 11371030 **Crankshaft** lengthwise **Rated rpm** 2200 **Bore and stroke** 3.939" × 4.500" *(100 mm × 114.3 mm)* **Compression ratio** 17 to 1 **Displacement** 219 cu in *(3590 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements with centrifugal precleaner **Oil filter** one full flow cartridge **Fuel filter** two paper elements with sediment bowl and screen **Muffler** vertical **Cooling medium temperature control** one thermostat.

CHASSIS: Type front wheel assist **Serial No.** 1390/18/11121736 **Tread width** rear 56" *(1422 mm)* to 84" *(2134 mm)* front 60" *(1524 mm)* to 72" *(1829 mm)* **Wheel base** 84" *(2134 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 36.2" *(920 mm)* Vertical distance above roadway 31.3" *(795 mm)* Horizontal distance from center of rear wheel tread 0" *(0 mm)* to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph *(km/h)*** first 1.0 *(1.7)* second 1.7 *(2.8)* third 2.1 *(3.3)* fourth 2.6 *(4.2)* fifth 3.0 *(4.8)* sixth 3.4 *(5.5)* seventh 4.3 *(7.0)* eighth 5.2 *(8.4)* ninth 5.9 *(9.5)* tenth 7.5 *(12.0)* eleventh 8.7 *(14.0)* twelfth 15.0 *(24.0)* reverse 1.7 *(2.7)*, 3.4 *(5.4)*, 4.3 *(6.9)*, 8.6 *(13.8)* **Clutch** single dry disc operated by foot pedal **Brakes** drum and shoe operated by two foot pedals which can be locked together and hand lever **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 138" *(3.51 m)* left 138" *(3.51 m)* (on concrete surface without brake) right 178" *(4.52 m)* left 178" *(4.52 m)* **Turning space diameter** (on concrete surface with brake applied) right 296" *(7.52 m)* left 296" *(7.52 m)* (on concrete surface without brake) right 372" *(9.45 m)* left 372" *(9.45 m)* **Power take-off** 1000 rpm at 2047 engine rpm and 540 rpm at 2077 engine rpm.

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

LUGGING ABILITY IN 8th (4-1) GEAR

Crankshaft Speed rpm	2200	1978	1756	1540	1312	1094
Pull—lbs *(kN)*	3974 *(17.68)*	4228 *(18.81)*	4451 *(19.80)*	4452 *(19.80)*	4540 *(20.19)*	4352 *(19.36)*
Increase in Pull %	0	6	12	12	14	10
Power—Hp *(kW)*	52.16 *(38.90)*	49.66 *(37.03)*	46.24 *(34.48)*	40.46 *(30.17)*	35.18 *(26.23)*	28.20 *(21.03)*
Speed—Mph *(km/h)*	4.92 *(7.92)*	4.40 *(7.08)*	3.90 *(6.28)*	3.41 *(5.49)*	2.91 *(4.68)*	2.43 *(3.91)*
Slip %	6.19	6.50	6.91	7.11	7.11	6.87

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)	Front Wheel Drive Disengaged dB(A)
Maximum Available Power—Two Hours	99.0	99.0
75% of Pull at Maximum Power—Ten Hours		96.0
50% of Pull at Maximum Power—Two Hours		94.0
50% of Pull at Reduced Engine Speed—Two Hours		93.0
Bystander in 12th (4-3) gear		88.0

DRAWBAR PERFORMANCE
(Front Wheel Drive Engaged)

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption			Temp. °F *(°C)*			
					gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Cool-ing med	Air wet bulb	Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power—Two Hours 8th (4-1) Gear											
50.26 *(37.48)*	3726 *(16.57)*	5.06 *(8.14)*	2200	4.71	3.960 *(14.991)*	0.552 *(0.336)*	12.69 *(2.500)*	214 *(101.1)*	54 *(11.9)*	73 *(22.5)*	28.770 *(97.140)*
MAXIMUM POWER IN SELECTED GEARS											
42.17 *(31.45)*	8624 *(38.36)*	1.83 *(2.95)*	2262	14.71	3rd (2-1) Gear			175 *(79.4)*	44 *(6.7)*	49 *(9.4)*	28.680 *(96.850)*
52.03 *(38.80)*	3863 *(17.18)*	5.05 *(8.13)*	2200	5.00	8th (4-1) Gear			190 *(87.8)*	47 *(8.3)*	60 *(15.6)*	28.960 *(97.790)*

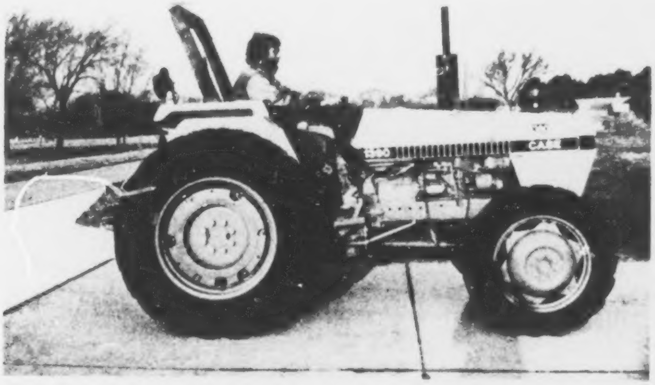
TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi *(kPa)*	Two 16.9/14-30; 6; 18 *(125)*	Two 16.9/14-30; 6; 18 *(125)*
Ballast	—Liquid (each)	550 lb *(249 kg)*	None
	—Cast Iron (each)	1000 lb *(454 kg)*	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 9.5-24; 6; 24 *(165)*	Two 9.5-24; 6; 24 *(165)*
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	30 lb *(14 kg)*	None
Height of drawbar		17.5 in *(445 mm)*	17.5 in *(445 mm)*
Static Weight with Operator	—Rear	6940 lb *(3148 kg)*	3840 lb *(1742 kg)*
	Front	2840 lb *(1288 kg)*	2780 lb *(1261 kg)*
	Total	9780 lb *(4436 kg)*	6620 lb *(3003 kg)*

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump was 159°F *(70.5°C)*. Eight gears were chosen between tire tangential pull limit (front wheel disengaged), 15% slip (front wheel drive engaged), and 10 mph *(16.1 km/h)*. During final inspection a single groove was found reaching the top of cylinder wall No. 4.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1380.**

LOUIS I. LEVITICUS
Engineer-in Charge

K. VON BARGEN
W. E. SPLINTER
L. L. BASHFORD
Board of Tractor Test Engineers



Case 1390 Manual Diesel

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Roy G. Arnold, Director

NEBRASKA TRACTOR TEST 1381 — CASE 1490 MANUAL DIESEL 12 SPEED

POWER TAKE-OFF PERFORMANCE

	Power Hp *(kW)*	Crank shaft speed rpm	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temperature °F *(°C)* Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg *(kPa)*
MAXIMUM POWER AND FUEL CONSUMPTION									
Rated Engine Speed—Two Hours (PTO Speed—1075 rpm)									
	70.51 *(52.58)*	2200	4.232 *(16.020)*	0.421 *(0.256)*	16.66 *(3.282)*	182 *(83.2)*	51 *(10.6)*	75 *(23.8)*	28.863 *(97.467)*
Standard Power Take-off Speed (1000 rpm)—One Hour									
	68.75 *(51.27)*	2047	4.002 *(15.149)*	0.408 *(0.248)*	17.18 *(3.384)*	182 *(83.1)*	51 *(10.6)*	75 *(23.8)*	28.845 *(97.405)*
VARYING POWER AND FUEL CONSUMPTION—Two Hours									
	62.57 *(46.66)*	2296	3.932 *(14.884)*	0.441 *(0.268)*	15.91 *(3.135)*	180 *(82.2)*	51 *(10.6)*	75 *(23.9)*	....
	0.00 *(0.00)*	2358	1.155 *(4.372)*	....	....	172 *(77.5)*	51 *(10.6)*	75 *(23.6)*	....
	31.49 *(23.48)*	2310	2.422 *(9.168)*	0.539 *(0.328)*	13.00 *(2.561)*	177 *(80.6)*	51 *(10.6)*	75 *(23.6)*	....
	70.79 *(52.79)*	2200	4.258 *(16.118)*	0.422 *(0.257)*	16.63 *(3.275)*	182 *(83.3)*	51 *(10.6)*	75 *(23.9)*	....
	15.80 *(11.78)*	2322	1.780 *(6.738)*	0.790 *(0.481)*	8.88 *(1.748)*	173 *(78.1)*	51 *(10.3)*	75 *(23.6)*	....
	46.77 *(34.88)*	2288	3.149 *(11.920)*	0.472 *(0.287)*	14.85 *(2.926)*	177 *(80.6)*	53 *(11.7)*	76 *(24.2)*	....
Av ***Av***	**37.90** ***(28.26)***	**2296**	**2.783** ***(10.535)***	**0.515** ***(0.313)***	**13.62** ***(2.682)***	**177** ***(80.4)***	**51** ***(10.7)***	**75** ***(23.8)***	**28.775** ***(97.169)***

DRAWBAR PERFORMANCE (Front Wheel Drive Disengaged)

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temp. °F *(°C)* Cool-ing med	Air wet bulb	Air dry bulb	Barom inch Hg *(kPa)*
Maximum Available Power—Two Hours 7th (3-2) Gear											
59.12 *(44.09)*	4864 *(21.64)*	4.56 *(7.34)*	2198	6.52	4.279 *(16.198)*	0.507 *(0.308)*	13.82 *(2.722)*	188 *(86.7)*	47 *(8.3)*	61 *(16.1)*	29.035 *(98.000)*
75% of Pull at Maximum Power—Ten Hours 7th (3-2) Gear											
48.22 *(35.96)*	3707 *(16.49)*	4.88 *(7.85)*	2306	4.67	3.708 *(14.036)*	0.539 *(0.328)*	13.00 *(2.561)*	186 *(85.6)*	51 *(10.4)*	60 *(15.6)*	28.980 *(97.860)*
50% of Pull at Maximum Power—Two Hours 7th (3-2) Gear											
33.49 *(24.97)*	2499 *(11.12)*	5.03 *(8.10)*	2339	3.16	2.977 *(11.269)*	0.623 *(0.379)*	11.25 *(2.216)*	184 *(84.4)*	50 *(9.7)*	60 *(15.6)*	29.040 *(98.050)*
50% of Pull at Reduced Engine Speed—Two Hours 9th (2-3) Gear											
33.42 *(24.92)*	2486 *(11.06)*	5.04 *(8.11)*	1720	3.05	2.336 *(8.843)*	0.490 *(0.298)*	14.31 *(2.819)*	182 *(83.3)*	51 *(10.6)*	68 *(20.0)*	28.990 *(97.890)*
MAXIMUM POWER IN SELECTED GEARS											
56.63 *(42.23)*	8340 *(37.10)*	2.55 *(4.10)*	2195	14.31		4th (3-1) Gear		186 *(85.6)*	46 *(7.8)*	51 *(10.6)*	29.050 *(98.100)*
56.79 *(42.35)*	7160 *(31.85)*	2.97 *(4.79)*	2199	10.76		5th (1-3) Gear		188 *(86.7)*	46 *(7.8)*	58 *(14.4)*	29.070 *(98.170)*
58.21 *(43.41)*	6200 *(27.58)*	3.52 *(5.66)*	2200	8.51		6th (2-2) Gear		189 *(87.2)*	46 *(7.8)*	58 *(14.4)*	29.070 *(98.170)*
60.24 *(44.92)*	4960 *(22.06)*	4.56 *(7.34)*	2200	6.69		7th (3-2) Gear		188 *(86.7)*	45 *(7.2)*	56 *(13.3)*	29.200 *(98.600)*
60.45 *(45.08)*	4024 *(17.90)*	5.63 *(9.07)*	2202	5.08		8th (4-1) Gear		187 *(86.1)*	45 *(7.2)*	56 *(13.3)*	29.200 *(98.600)*
58.71 *(43.78)*	3471 *(15.44)*	6.34 *(10.21)*	2199	4.51		9th (2-3) Gear		188 *(86.7)*	46 *(7.8)*	58 *(14.4)*	29.070 *(98.170)*
59.05 *(44.03)*	2722 *(12.11)*	8.14 *(13.10)*	2201	3.57		10th (3-3) Gear		188 *(86.7)*	46 *(7.8)*	58 *(14.4)*	29.070 *(98.170)*

Department of Agricultural Engineering

Dates of Test: March 17-April 2, 1981

Manufacturer: J. I. CASE COMPANY, Racine, Wisconsin 53404

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 46.3 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60° *(15°/15°)*** 0.8420 **Fuel weight** 7.011 lbs/gal *(0.840 kg/l)* **Oil SAE** 30 **API service classification** CD-SE **To motor** 2.398 gal *(9.077 l)* **Drained from motor** 1.834 gal *(6.942 l)* **Transmission lubricant** Case TFD fluid **Final drive lubricant** Case ETHB fluid **Front axle lubricant** Case FDL SAE 90 **Total time engine was operated** 45.0 hours

ENGINE Make Case Diesel **Type** four cylinder vertical with turbocharger **Serial No.** 220102 11410775 **Crankshaft** lengthwise **Rated rpm** 2200 **Bore and stroke** 3.939" × 4.500" *(100 mm × 114.3 mm)* **Compression ratio** 16 to 1 **Displacement** 219 cu in *(3590 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements with centrifugal precleaner **Oil filter** one full flow cartridge **Fuel filter** two paper elements with sediment bowl and screen **Muffler** vertical **Cooling medium temperature control** one thermostat.

CHASSIS: Type front wheel assist **Serial No.** 1490/18/11181306 **Tread width** rear 60.75" *(1543 mm)* to 85" *(2159 mm)* front 59" *(1499 mm)* to 71" *(1803 mm)* **Wheel base** 88" *(2235 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 37.0" *(940 mm)* Vertical distance above roadway 33.0" *(838 mm)* Horizontal distance from center of rear wheel tread 0" *(0 mm)* to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph *(km/h)*** first 1.1 *(1.8)* second 1.8 *(2.9)* third 2.2 *(3.6)* fourth 2.8 *(4.6)* fifth 3.2 *(5.2)* sixth 3.7 *(5.9)* seventh 4.7 *(7.5)* eighth 5.7 *(9.2)* ninth 6.4 *(10.3)* tenth 8.1 *(13.0)* eleventh 9.3 *(15.0)* twelfth 16.1 *(25.9)* reverse 1.9 *(3.0)*, 3.8 *(6.0)*, 4.8 *(7.7)*, 9.5 *(15.3)* **Clutch** single dry disc hydraulically operated by foot pedal **Brakes** multiple wet disc hydraulically operated by two foot pedals which can be locked together and hand lever **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 147" *(3.73 m)* left 147" *(3.73 m)* (on concrete surface without brake) right 192" *(4.88 m)* left 192" *(4.88 m)* **Turning space diameter** (on concrete surface with brake applied) right 308" *(7.82 m)* left 308" *(7.82 m)* (on concrete surface without brake) right 398" *(10.11 m)* left 398" *(10.11 m)* **Power take-off** 1000 rpm at 2047 engine rpm and 540 rpm at 2077 engine rpm.

LUGGING ABILITY IN 7th (3-2) GEAR

Crankshaft Speed rpm	2200	1979	1759	1537	1320	1098
Pull—lbs *(kN)*	4960 *(22.06)*	5363 *(23.86)*	5591 *(24.87)*	5768 *(25.66)*	5721 *(25.45)*	5419 *(24.10)*
Increase in Pull %	0	8	13	16	15	9
Power—Hp *(kW)*	60.24 *(44.92)*	58.20 *(43.40)*	53.69 *(40.04)*	48.20 *(35.94)*	41.14 *(30.68)*	32.56 *(24.28)*
Speed—Mph *(km/h)*	4.56 *(7.34)*	4.07 *(6.55)*	3.60 *(5.79)*	3.13 *(5.04)*	2.70 *(4.35)*	2.25 *(3.62)*
Slip %	6.69	7.37	7.77	8.04	7.91	7.50

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)	Front Wheel Drive Disengaged dB(A)
Maximum Available Power—Two Hours	93.5	94.0
75% of Pull at Maximum Power—Ten Hours		93.0
50% of Pull at Maximum Power—Two Hours		92.5
50% of Pull at Reduced Engine Speed—Two Hours		90.0
Bystander in 12th (4-3) gear		84.0

DRAWBAR PERFORMANCE
(Front Wheel Drive Engaged)

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr *(l/h)*	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Fuel Consumption Hp.hr/gal *(kW.h/l)*	Temp. °F *(°C)* Cool-ing med	Temp. °F *(°C)* Air wet bulb	Temp. °F *(°C)* Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power—Two Hours 7th (3-2) Gear											
60.31 *(44.97)*	4831 *(21.49)*	4.68 *(7.53)*	2199	4.71	4.297 *(16.266)*	0.500 *(0.304)*	14.04 *(2.766)*	189 *(87.2)*	48 *(8.6)*	61 *(16.1)*	29.000 *(97.930)*
MAXIMUM POWER IN SELECTED GEARS											
55.20 *(41.16)*	9919 *(44.12)*	2.09 *(3.36)*	2275	14.68	3rd (2-1) Gear			187 *(86.1)*	44 *(6.7)*	50 *(10.0)*	29.050 *(98.100)*
61.52 *(45.88)*	4931 *(21.93)*	4.68 *(7.53)*	2200	4.82	7th (3-2) Gear			188 *(86.7)*	45 *(7.2)*	56 *(13.3)*	29.200 *(98.600)*

TIRES, BALLAST AND WEIGHT		**With Ballast**	**Without Ballast**
Rear Tires	—No., size, ply & psi *(kPa)*	Two 18.4-34; 6; 16 *(110)*	Two 18.4-34; 6; 16 *(110)*
Ballast	—Liquid (each)	1218 lb *(552 kg)*	None
	—Cast Iron (each)	500 lb *(227 kg)*	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 12.4R24; 6; 24 *(165)*	Two 12.4R24; 6; 24 *(165)*
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	82 lb *(37 kg)*	None
Height of drawbar		20 in *(510 mm)*	20 in *(510 mm)*
Static Weight with Operator	—Rear	7965 lb *(3615 kg)*	4530 lb *(2055 kg)*
	Front	3340 lb *(1515 kg)*	3175 lb *(1440 kg)*
	Total	11305 lb *(5128 kg)*	7705 lb *(3495 kg)*

Case 1490 Manual Diesel

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump was 155°F *(68.1°C)*. Seven gears were chosen between 15% slip and 10 mph *(16.1 km/h)*.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1381.**

LOUIS I. LEVITICUS
Engineer-in Charge

K. VON BARGEN
W. E. SPLINTER
L. L. BASHFORD
Board of Tractor Test Engineers

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Roy G. Arnold, Director

NEBRASKA TRACTOR TEST 1382 — CASE 1490 POWERSHIFT DIESEL 12 SPEED

POWER TAKE-OFF PERFORMANCE

	Power	Crank	Fuel Consumption			Temperature °F *(°C)*			
	Hp *(kW)*	shaft speed rpm	gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg *(kPa)*
MAXIMUM POWER AND FUEL CONSUMPTION									
Rated Engine Speed—Two Hours (PTO Speed—1075 rpm)									
	70.91	2200	4.544	0.449	15.60	190	55	75	29.020
	(52.88)		*(17.201)*	*(0.273)*	*(3.074)*	*(87.7)*	*(12.9)*	*(24.1)*	*(97.996)*
Standard Power take-off Speed (1000 rpm)—One Hour									
	70.48	2048	4.292	0.427	16.42	190	55	75	29.000
	(52.56)		*(16.247)*	*(0.260)*	*(3.235)*	*(87.6)*	*(12.9)*	*(23.9)*	*(97.929)*
VARYING POWER AND FUEL CONSUMPTION—Two Hours									
	62.57	2285	4.253	0.477	14.71	183	55	75	......
	(46.66)		*(16.099)*	*(0.290)*	*(2.898)*	*(83.9)*	*(12.8)*	*(23.9)*	......
	0.00	2368	1.472	.....	.....	172	55	74	......
	(0.00)		*(5.572)*	.....	.....	*(77.8)*	*(12.8)*	*(23.3)*	......
	31.99	2334	2.764	0.606	11.57	175	55	75	......
	(23.85)		*(10.463)*	*(0.369)*	*(2.279)*	*(79.4)*	*(12.8)*	*(23.6)*	......
	71.86	2202	4.596	0.448	15.64	190	56	76	......
	(53.59)		*(17.398)*	*(0.273)*	*(3.080)*	*(87.5)*	*(13.3)*	*(24.4)*	......
	16.11	2350	2.045	0.890	7.88	174	56	76	......
	(12.01)		*(7.741)*	*(0.541)*	*(1.551)*	*(78.6)*	*(13.3)*	*(24.2)*	......
	47.45	2310	3.479	0.514	13.64	179	55	75	......
	(35.38)		*(13.169)*	*(0.313)*	*(2.687)*	*(81.7)*	*(12.8)*	*(23.9)*	......
Av	**38.33**	**2308**	**3.102**	**0.567**	**12.36**	**179**	**55**	**75**	**28.997**
Av	***(28.58)***		***(11.742)***	***(0.345)***	***(2.434)***	***(81.5)***	***(12.9)***	***(23.9)***	***(97.917)***

DRAWBAR PERFORMANCE

Power	Drawbar	Speed	Crank-	Slip	Fuel Consumption			Temp. °F *(°C)*			
Hp *(kW)*	pull lbs *(kN)*	mph *(km/h)*	shaft speed rpm	%	gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Cool-ing med	Air wet bulb	Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power—Two Hours 7th (2-3) Gear											
60.12	4656	4.85	2199	6.61	4.582	0.534	13.12	192	54	66	28.795
(44.83)	*(20.71)*	*(7.81)*			*(17.345)*	*(0.325)*	*(2.585)*	*(88.9)*	*(12.5)*	*(18.9)*	*(97.240)*
75% of Pull at Maximum Power—Ten Hours 7th (2-3) Gear											
48.90	3569	5.14	2290	4.89	4.072	0.584	12.01	187	56	62	28.800
(36.46)	*(15.88)*	*(8.27)*			*(15.414)*	*(0.355)*	*(2.366)*	*(86.1)*	*(13.1)*	*(16.7)*	*(97.250)*
50% of Pull at Maximum Power—Two Hours 7th (2-3) Gear											
33.47	2374	5.29	2316	3.25	3.281	0.687	10.20	185	58	65	28.645
(24.96)	*(10.56)*	*(8.51)*			*(12.420)*	*(0.418)*	*(2.009)*	*(85.0)*	*(14.2)*	*(18.3)*	*(96.730)*
50% of Pull at Reduced Engine Speed—Two Hours 9th (2-4) Gear											
33.55	2368	5.31	1702	3.17	2.496	0.522	13.44	181	59	68	28.630
(25.02)	*(10.53)*	*(8.55)*			*(9.448)*	*(0.318)*	*(2.648)*	*(82.8)*	*(15.0)*	*(20.0)*	*(96.680)*
MAXIMUM POWER IN SELECTED GEARS											
52.22	8405	2.33	2275	14.78	4th (1-4) Gear			188	46	50	28.860
(38.94)	*(37.39)*	*(3.75)*						*(86.7)*	*(7.8)*	*(10.0)*	*(97.460)*
55.18	8267	2.50	2202	14.60	5th (2-1) Gear			189	48	54	28.850
(41.15)	*(36.77)*	*(4.03)*						*(87.2)*	*(8.9)*	*(12.2)*	*(97.420)*
59.15	6088	3.64	2201	8.87	6th (2-2) Gear			190	51	58	28.850
(44.11)	*(27.08)*	*(5.86)*						*(87.8)*	*(10.6)*	*(14.4)*	*(97.420)*
61.10	4727	4.85	2200	6.65	7th (2-3) Gear			190	48	54	28.850
(45.56)	*(21.03)*	*(7.81)*						*(87.8)*	*(8.9)*	*(12.2)*	*(97.420)*
59.58	3404	6.56	2201	4.74	8th (3-1) Gear			190	52	59	28.840
(44.43)	*(15.14)*	*(10.46)*						*(87.8)*	*(11.1)*	*(15.0)*	*(97.390)*
61.56	3415	6.76	2199	4.74	9th (2-4) Gear			190	53	60	28.830
(45.91)	*(15.19)*	*(10.88)*						*(87.8)*	*(11.7)*	*(15.6)*	*(97.350)*
58.69	2420	9.10	2200	3.28	10th (3-2) Gear			190	53	61	28.820
(43.77)	*(10.76)*	*(14.65)*						*(87.8)*	*(11.7)*	*(16.1)*	*(97.320)*

Department of Agricultural Engineering

Dates of Test: March 18-April 2, 1981

Manufacturer: J. I. CASE COMPANY, Racine, Wisconsin 53404

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 46.3 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60°** ***(15°/15°)*** 0.8420 **Fuel weight** 7.011 lbs/gal *(0.840 kg/l)* **Oil SAE** 30 **API service classification** CD-SE **To motor** 2.520 gal *(9.535 l)* **Drained from motor** 1.813 gal *(6.863 l)* **Transmission lubricant** Case TFD fluid **Final drive lubricant** Case ETHB fluid **Total time engine was operated** 37.0 hours

ENGINE Make Case Diesel **Type** four cylinder vertical with turbocharger **Serial No.** 220101 11410830 **Crankshaft** lengthwise **Rated rpm** 2200 **Bore and stroke** 3.939" × 4.500" *(100 mm × 114.3 mm)* **Compression ratio** 16 to 1 **Displacement** 219 cu in *(3590 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements with centrifugal precleaner **Oil filter** one full flow cartridge **Fuel filter** two paper elements with sediment bowl and screen **Muffler** vertical **Cooling medium temperature control** one thermostat.

CHASSIS: Type standard **Serial No.** 1490/53/11181533 **Tread width** rear 60.75" *(1543 mm)* to 85" *(2159 mm)* front 60" *(1524 mm)* to 88" *(2235 mm)* **Wheel base** 88" *(2235 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 29.7" *(754 mm)* Vertical distance above roadway 37.7" *(958 mm)* Horizontal distance from center of rear wheel tread 0" *(0 mm)* to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial (4) range operator controlled powershift **Advertised speeds mph *(km/h)*** first 1.0 *(1.6)* second 1.4 *(2.2)* third 1.8 *(2.9)* fourth 2.5 *(4.0)* fifth 2.8 *(4.5)* sixth 3.8 *(6.1)* seventh 5.0 *(8.0)* eighth 6.6 *(10.6)* ninth 6.8 *(10.9)* tenth 9.0 *(14.4)* eleventh 11.7 *(18.8)* twelfth 16.0 *(25.7)* reverse 2.9 *(4.6)*, 4.0 *(6.4)*, 5.1 *(8.2)*, 7.0 *(11.3)* **Clutch** single dry disc hydraulically operated by foot pedal **Brakes** multiple wet disc hydraulically operated by two foot pedals which can be locked together and hand lever **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 143" *(3.63 m)* left 143" *(3.63 m)* (on concrete surface without brake) right 158" *(4.01 m)* left 158" *(4.01 m)* **Turning space diameter** (on concrete surface with brake applied) right 298" *(7.57 m)* left 298" *(7.57 m)* (on concrete surface without brake) right 328" *(8.33 m)* left 328" *(8.33 m)* **Power take-off** 1000 rpm at 2048 engine rpm and 540 rpm at 2077 engine rpm.

LUGGING ABILITY IN 7th (2-3) GEAR

Crankshaft Speed rpm	2200	1983	1758	1536	1309	1094
Pull—lbs *(kN)*	4727 *(21.03)*	5170 *(23.00)*	5462 *(24.30)*	5614 *(24.97)*	5561 *(24.74)*	5347 *(23.78)*
Increase in Pull %	0	9	16	19	18	13
Power—Hp *(kW)*	61.10 *(45.56)*	59.84 *(44.62)*	55.75 *(41.57)*	49.97 *(37.26)*	42.20 *(31.47)*	34.05 *(25.39)*
Speed—Mph *(km/h)*	4.85 *(7.81)*	4.34 *(6.98)*	3.83 *(6.16)*	3.34 *(5.38)*	2.85 *(4.59)*	2.39 *(3.85)*
Slip %	6.65	7.19	7.74	8.01	8.01	7.47

TRACTOR SOUND LEVEL WITH CAB	dB(A)
Maximum Available Power—Two Hours	80.5
75% of Pull at Maximum Power—Ten Hours	81.5
50% of Pull at Maximum Power—Two Hours	81.0
50% of Pull at Reduced Engine Speed—Two Hours	79.0
Bystander in 12th (3-4) gear	83.0

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi *(kPa)*	Two 18.4-34; 6; 16 *(110)*	Two 18.4-34; 6; 16 *(110)*
Ballast	—Liquid (each)	1042 lb *(473 kg)*	None
	—Cast Iron (each)	200 lb *(91 kg)*	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 11L-15; 6; 28 *(195)*	Two 11L-15; 6; 28 *(195)*
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	75 lb *(34 kg)*	None
Height of drawbar		22 in *(560 mm)*	22 in *(560 mm)*
Static Weight with Operator	—Rear	8060 lb *(3656 kg)*	5575 lb *(2529 kg)*
	Front	3000 lb *(1361 kg)*	2850 lb *(1293 kg)*
	Total	11060 lb *(5017 kg)*	8425 lb *(3822 kg)*

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump was 180°F *(82.3°C)*. Seven gears were chosen between 15% slip and 10 mph *(16.1 km/h)*. Upon removal of the upper radiator hose, the cooling system was found to be partially blocked by tape. During final inspection, a number of shallow scratches were found on the cylinder walls.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1382.**

LOUIS I. LEVITICUS
Engineer-in Charge

K. VON BARGEN
W. E. SPLINTER
L. L. BASHFORD
Board of Tractor Test Engineers

Case 1490 Powershift DSL

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Roy G. Arnold, Director

NEBRASKA TRACTOR TEST 1383 — CASE 1690 MANUAL DIESEL 12 SPEED (WITH MECHANICAL FRONT WHEEL DRIVE)

POWER TAKE-OFF PERFORMANCE

	Power Hp *(kW)*	Crank shaft speed rpm	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temperature °F *(°C)* Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg *(kPa)*
	MAXIMUM POWER AND FUEL CONSUMPTION								
	Rated Engine Speed—Two Hours (PTO Speed—1123 rpm)								
	90.39 *(67.40)*	2300	5.803 *(21.967)*	0.450 *(0.274)*	15.58 *(3.068)*	188 *(86.4)*	59 *(14.8)*	75 *(23.8)*	28.777 *(97.174)*
	Standard Power take-off Speed (1000 rpm)—One Hour								
	87.76 *(65.44)*	2048	5.500 *(20.820)*	0.439 *(0.267)*	15.95 *(3.143)*	194 *(90.2)*	60 *(15.5)*	75 *(24.1)*	28.815 *(97.304)*
	VARYING POWER AND FUEL CONSUMPTION—Two Hours								
	78.07 *(58.22)*	2340	4.829 *(18.280)*	0.434 *(0.264)*	16.16 *(3.185)*	182 *(83.1)*	60 *(15.6)*	75 *(23.6)*	....
	0.00 *(0.00)*	2448	1.336 *(5.057)*	....	....	177 *(80.6)*	60 *(15.6)*	75 *(23.9)*	....
	39.99 *(29.82)*	2390	2.847 *(10.777)*	0.499 *(0.303)*	14.05 *(2.767)*	179 *(81.7)*	60 *(15.6)*	75 *(23.9)*	....
	91.22 *(68.02)*	2300	5.900 *(22.334)*	0.453 *(0.276)*	15.46 *(3.046)*	187 *(86.1)*	60 *(15.6)*	75 *(23.9)*	....
	20.19 *(15.06)*	2413	2.059 *(7.794)*	0.715 *(0.435)*	9.81 *(1.932)*	178 *(81.1)*	60 *(15.6)*	75 *(23.9)*	....
	59.18 *(44.13)*	2368	3.725 *(14.101)*	0.441 *(0.268)*	15.89 *(3.130)*	180 *(82.2)*	60 *(15.3)*	74 *(23.3)*	....
Av ***Av***	**48.11** ***(35.88)***	**2377**	**3.449** ***(13.056)***	**0.502** ***(0.306)***	**13.95** ***(2.748)***	**180** ***(82.4)***	**60** ***(15.5)***	**75** ***(23.8)***	**28.853** ***(97.433)***

DRAWBAR PERFORMANCE (Front Wheel Drive Engaged)

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temp. °F *(°C)* Cooling med	Air wet bulb	Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power—Two Hours 7th (3-2) Gear											
72.55 *(54.10)*	6302 *(28.03)*	4.32 *(6.95)*	2299	6.39	5.495 *(20.801)*	0.531 *(0.323)*	13.20 *(2.600)*	198 *(92.2)*	59 *(15.0)*	66 *(18.9)*	28.775 *(97.170)*
75% of Pull at Maximum Power—Ten Hours 7th (3-2) Gear											
61.80 *(46.09)*	5145 *(22.89)*	4.50 *(7.25)*	2368	5.01	4.578 *(17.328)*	0.519 *(0.316)*	13.50 *(2.660)*	194 *(90.2)*	45 *(7.3)*	56 *(13.4)*	29.400 *(99.270)*
50% of Pull at Maximum Power—Two Hours 7th (3-2) Gear											
42.73 *(31.86)*	3430 *(15.26)*	4.67 *(7.52)*	2405	2.93	3.479 *(13.169)*	0.570 *(0.347)*	12.28 *(2.419)*	182 *(83.3)*	50 *(10.0)*	52 *(11.1)*	28.975 *(97.840)*
50% of Pull at Reduced Engine Speed—Two Hours 10th (3-3) Gear											
42.57 *(31.75)*	3419 *(15.21)*	4.67 *(7.51)*	1392	2.89	2.926 *(11.076)*	0.481 *(0.293)*	14.55 *(2.866)*	183 *(83.9)*	52 *(11.1)*	54 *(12.2)*	28.935 *(97.710)*
MAXIMUM POWER IN SELECTED GEARS											
67.41 *(50.27)*	10536 *(46.87)*	2.40 *(3.86)*	2311	14.95		4th (3-1) Gear		187 *(86.1)*	54 *(12.2)*	56 *(13.3)*	28.810 *(97.290)*
69.76 *(52.02)*	9382 *(41.73)*	2.79 *(4.49)*	2298	11.11		5th (1-3) Gear		192 *(88.9)*	55 *(12.8)*	60 *(15.6)*	28.830 *(97.350)*
74.23 *(55.35)*	8503 *(37.82)*	3.27 *(5.27)*	2300	9.90		6th (2-2) Gear		206 *(96.7)*	43 *(6.1)*	55 *(12.8)*	29.530 *(99.720)*
78.08 *(58.22)*	6855 *(30.49)*	4.27 *(6.87)*	2299	7.18		7th (3-2) Gear		204 *(95.6)*	45 *(7.2)*	57 *(13.9)*	29.540 *(99.750)*
77.09 *(57.49)*	5457 *(24.27)*	5.30 *(8.53)*	2298	5.37		8th (4-1) Gear		202 *(94.4)*	43 *(6.1)*	53 *(11.7)*	29.570 *(99.850)*
76.13 *(56.77)*	4768 *(21.21)*	5.99 *(9.64)*	2300	4.51		9th (2-3) Gear		203 *(95.0)*	45 *(7.2)*	57 *(13.9)*	29.550 *(99.790)*
77.24 *(57.60)*	3775 *(16.79)*	7.67 *(12.35)*	2301	3.49		10th (3-3) Gear		206 *(96.7)*	43 *(6.1)*	55 *(12.8)*	29.530 *(99.720)*
75.21 *(56.08)*	3163 *(14.07)*	8.92 *(14.36)*	2300	2.89		11th (4-2) Gear		206 *(96.7)*	43 *(6.1)*	55 *(12.8)*	29.520 *(99.680)*

Department of Agricultural Engineering

Dates of Test: March 27-April 21, 1981

Manufacturer: J. I. CASE COMPANY, Racine, Wisconsin 53404

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 46.3 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60°** *(15°/15°)* 0.8416 **Fuel weight** 7.007 lbs/gal *(0.840 kg/l)* **Oil SAE** 30 **API service classification** CD-SE **To motor** 3.552 gal *(13.446 l)* **Drained from motor** 2.638 gal *(9.986 l)* **Transmission lubricant** Case TFD fluid **Final drive lubricant** Case ETHB fluid **Front axle lubricant** Case FDL SAE 90 **Total time engine was operated** 53.0 hours.

ENGINE Make Case Diesel **Type** six cylinder vertical **Serial No.** 330001 11450442 **Crankshaft** lengthwise **Rated rpm** 2300 **Bore and stroke** 3.939" × 4.500" *(100 mm × 114.3 mm)* **Compression ratio** 16 to 1 **Displacement** 329 cu in *(5393 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two sets of two paper elements in parallel with centrifugal precleaner **Oil filter** one full flow cartridge **Fuel filter** two paper elements with sediment bowl and screen **Muffler** vertical **Cooling medium temperature control** one thermostat.

CHASSIS: Type front wheel assist **Serial No.** 1690/18/11210359 **Tread width** rear 60.75" *(1543 mm)* to 85" *(2159 mm)* front 59" *(1499 mm)* to 71" *(1803 mm)* **Wheel base** 100.5" *(2553 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 40.4" *(1026 mm)* Vertical distance above roadway 32.7" *(831 mm)* Horizontal distance from center of rear wheel tread 0" *(0 mm)* to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph *(km/h)*** first 1.0 *(1.7)* second 1.7 *(2.8)* third 2.1 *(3.4)* fourth 2.7 *(4.3)* fifth 3.0 *(4.8)* sixth 3.5 *(5.6)* seventh 4.4 *(7.0)* eighth 5.3 *(8.6)* ninth 6.0 *(9.6)* tenth 7.6 *(12.1)* eleventh 8.7 *(14.1)* twelfth 15.1 *(24.3)* reverse 1.8 *(2.8)*, 3.5 *(5.7)*, 4.5 *(7.2)*, 8.9 *(14.3)* **Clutch** single dry disc hydraulically operated by foot pedal **Brakes** multiple wet disc hydraulically operated by two foot pedals which can be locked together and hand lever **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 166" *(4.22 m)* left 166" *(4.22 m)* (on concrete surface without brake) right 213" *(5.41 m)* left 213" *(5.41 m)* **Turning space diameter** (on concrete surface with brake applied) right 347" *(8.81 m)* left 347" *(8.81 m)* (on concrete surface without brake) right 441" *(11.20 m)* left 441" *(11.20 m)* **Power take-off** 1000 rpm at 2048 engine rpm and 540 rpm at 2077 engine rpm.

LUGGING ABILITY IN 7th (3-2) GEAR

Crankshaft Speed rpm	2299	2076	1840	1609	1375	1150
Pull—lbs *(kN)*	6855 *(30.49)*	7596 *(33.79)*	7989 *(35.54)*	8311 *(36.97)*	8390 *(37.32)*	8250 *(36.70)*
Increase in Pull %	0	11	17	21	22	20
Power—Hp *(kW)*	78.08 *(58.22)*	77.24 *(57.60)*	71.49 *(53.31)*	64.68 *(48.23)*	55.70 *(41.54)*	45.86 *(34.20)*
Speed—Mph *(km/h)*	4.27 *(6.87)*	3.81 *(6.13)*	3.36 *(5.41)*	2.92 *(4.70)*	2.49 *(4.01)*	2.08 *(3.35)*
Slip %	7.18	8.13	8.93	9.45	9.58	9.45

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)	Front Wheel Drive Disengaged dB(A)
Maximum Available Power—Two Hours	97.0	96.5
75% of Pull at Maximum Power—Ten Hours	99.5	
50% of Pull at Maximum Power—Two Hours	95.0	
50% of Pull at Reduced Engine Speed—Two Hours	90.5	
Bystander in 12th (4-3) gear		88.0

DRAWBAR PERFORMANCE
(Front Wheel Drive Disengaged)

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption			Temp. °F *(°C)*			Barom. inch Hg *(kPa)*
					gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Cool-ing med	Air wet bulb	Air dry bulb	
Maximum Available Power—Two Hours 7th (3-2) Gear											
70.30 *(52.42)*	6344 *(28.22)*	4.16 *(6.69)*	2299	8.63	5.477 *(20.733)*	0.546 *(0.332)*	12.84 *(2.529)*	201 *(93.9)*	55 *(12.8)*	72 *(22.2)*	28.900 *(97.570)*
MAXIMUM POWER IN SELECTED GEARS											
63.06 *(47.02)*	8785 *(39.08)*	2.69 *(4.33)*	2336	14.68	5th (1-3) Gear			195 *(90.6)*	55 *(12.8)*	66 *(18.9)*	28.860 *(97.460)*
76.29 *(56.89)*	6944 *(30.89)*	4.12 *(6.63)*	2300	9.35	7th (3-2) Gear			203 *(95.0)*	45 *(7.2)*	57 *(13.9)*	29.530 *(99.720)*
76.75 *(57.23)*	5602 *(24.92)*	5.14 *(8.27)*	2300	7.10	8th (4-1) Gear			201 *(93.9)*	44 *(6.7)*	56 *(13.3)*	29.560 *(99.820)*

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi *(kPa)*	Two 18.4-34; 6; 16 *(110)*	Two 18.4-34; 6; 16 *(110)*
Ballast	—Liquid (each)	1190 lb *(540 kg)*	None
	—Cast Iron (each)	642 lb *(291 kg)*	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 13.6-24; 6; 18 *(125)*	Two 13.6-24; 6; 18 *(125)*
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	25 lb *(11 kg)*	None
Height of drawbar		20.5 in *(520 mm)*	20.5 in *(520 mm)*
Static Weight with Operator	—Rear	8915 lb *(4044 kg)*	5250 lb *(2381 kg)*
	Front	3555 lb *(1612 kg)*	3505 lb *(1590 kg)*
	Total	12470 lb *(5656 kg)*	8755 lb *(3971 kg)*

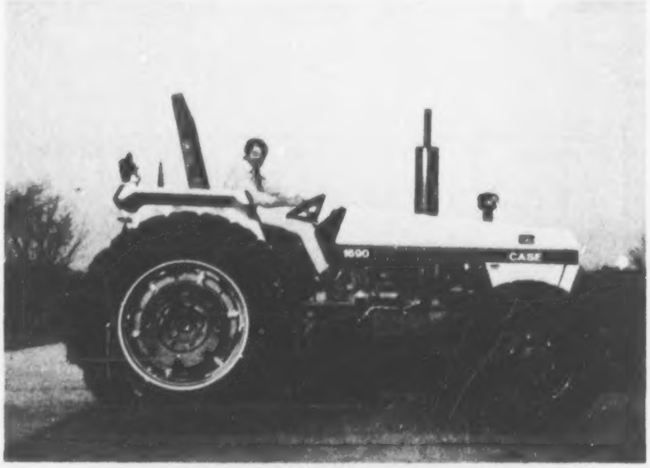
REPAIRS and ADJUSTMENTS: During preliminary PTO tests, two injectors were replaced and all injectors were readjusted for proper pressure. The fuel transfer pump was replaced during preliminary drawbar tests. New injectors were installed after the 10 hour test.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump was 155°F *(68.3°C)*. Eight gears were chosen between 15% slip and 10 mph *(16.1 km/h)*. The performance figures on this report apply to those models equipped with mechanical front wheel drive. The exhaust valves of No. 1 and No. 6 cylinders were pitted.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1383.**

LOUIS I. LEVITICUS
Engineer-in Charge

K. VON BARGEN
W. E. SPLINTER
L. L. BASHFORD
Board of Tractor Test Engineers



Case 1690 Manual Diesel

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Roy G. Arnold, Director

NEBRASKA TRACTOR TEST 1385 — HESSTON 480-8 DT FIAT DIESEL ALSO HESSTON 480-8 FIAT DIESEL 12 SPEED — ALSO 8 SPEED

POWER TAKE-OFF PERFORMANCE

	Power Hp *(kW)*	Crank shaft speed rpm	Fuel Consumption			Temperature °F *(°C)*			Barometer inch Hg *(kPa)*
			gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Cooling medium	Air wet bulb	Air dry bulb	
MAXIMUM POWER AND FUEL CONSUMPTION									
Rated Engine Speed—Two Hours (PTO Speed—650 rpm)									
	42.58 *(31.75)*	2600	2.720 *(10.296)*	0.447 *(0.272)*	15.65 *(3.084)*	170 *(76.7)*	66 *(18.8)*	75 *(23.9)*	28.900 *(97.591)*
Standard Power take-off Speed (540 rpm)—One Hour									
	40.36 *(30.10)*	2160	2.384 *(9.024)*	0.414 *(0.252)*	16.93 *(3.336)*	170 *(76.4)*	66 *(18.8)*	75 *(23.9)*	28.795 *(97.236)*
VARYING POWER AND FUEL CONSUMPTION—Two Hours									
	37.71 *(28.12)*	2708	2.524 *(9.554)*	0.469 *(0.285)*	14.94 *(2.943)*	169 *(75.8)*	66 *(18.6)*	76 *(24.2)*	....
	0.00 *(0.00)*	2798	0.934 *(3.536)*	....	....	164 *(73.3)*	66 *(18.9)*	76 *(24.2)*	....
	19.21 *(14.32)*	2758	1.693 *(6.409)*	0.617 *(0.375)*	11.35 *(2.234)*	168 *(75.6)*	66 *(18.9)*	76 *(24.4)*	....
	42.73 *(31.86)*	2600	2.717 *(10.285)*	0.445 *(0.271)*	15.73 *(3.098)*	172 *(77.8)*	67 *(19.4)*	77 *(25.0)*	....
	9.70 *(7.23)*	2782	1.277 *(4.834)*	0.922 *(0.561)*	7.59 *(1.496)*	165 *(73.9)*	67 *(19.2)*	77 *(24.7)*	....
	28.48 *(21.24)*	2728	2.087 *(7.900)*	0.513 *(0.312)*	13.65 *(2.689)*	169 *(76.1)*	67 *(19.4)*	77 *(24.7)*	....
Av ***Av***	**22.97** ***(17.13)***	**2729**	**1.872** ***(7.086)***	**0.571** ***(0.347)***	**12.27** ***(2.417)***	**168** ***(75.4)***	**66** ***(19.1)***	**76** ***(24.6)***	**28.823** ***(97.332)***

DRAWBAR PERFORMANCE (Front Wheel Drive Disengaged)

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption			Temp. °F *(°C)*			Barom. inch Hg *(kPa)*
					gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Cool-ing med	Air wet bulb	Air dry bulb	
Maximum Available Power—Two Hours 9th (H1) Gear											
35.98 *(26.83)*	2662 *(11.84)*	5.07 *(8.16)*	2599	6.29	2.696 *(10.206)*	0.525 *(0.319)*	13.34 *(2.628)*	178 *(81.1)*	57 *(13.9)*	65 *(18.3)*	28.855 *(97.440)*
75% of Pull at Maximum Power—Ten Hours 9th (H1) Gear											
29.52 *(22.01)*	2062 *(9.17)*	5.37 *(8.64)*	2703	4.55	2.353 *(8.908)*	0.558 *(0.340)*	12.54 *(2.470)*	178 *(81.1)*	60 *(15.7)*	73 *(22.9)*	28.780 *(97.186)*
50% of Pull at Maximum Power—Two Hours 9th (H1) Gear											
20.14 *(15.02)*	1374 *(6.11)*	5.50 *(8.85)*	2742	3.65	1.893 *(7.164)*	0.658 *(0.400)*	10.64 *(2.096)*	176 *(80.0)*	54 *(11.9)*	64 *(17.5)*	28.975 *(97.844)*
50% of Pull at Reduced Engine Speed—Two Hours 10th (H2) Gear											
20.34 *(15.17)*	1386 *(6.17)*	5.50 *(8.86)*	1821	3.38	1.482 *(5.610)*	0.510 *(0.310)*	13.73 *(2.704)*	175 *(79.2)*	56 *(13.1)*	69 *(20.6)*	28.975 *(97.844)*
MAXIMUM POWER IN SELECTED GEARS											
28.22 *(21.05)*	5265 *(23.42)*	2.01 *(3.24)*	2718	14.93	6th (L2) Gear			175 *(79.2)*	47 *(8.3)*	53 *(11.7)*	28.950 *(97.760)*
35.22 *(26.26)*	4528 *(20.14)*	2.92 *(4.69)*	2600	12.01	7th (L3) Gear			179 *(81.7)*	54 *(12.2)*	59 *(15.0)*	28.880 *(97.520)*
36.07 *(26.90)*	3444 *(15.32)*	3.93 *(6.32)*	2600	8.22	8th (L4) Gear			178 *(81.1)*	54 *(12.2)*	58 *(14.4)*	28.870 *(97.490)*
37.07 *(27.65)*	2740 *(12.19)*	5.07 *(8.17)*	2599	6.15	9th (H1) Gear			178 *(81.1)*	53 *(11.7)*	57 *(13.9)*	28.870 *(97.490)*
36.15 *(26.95)*	1736 *(7.72)*	7.81 *(12.57)*	2598	3.98	10th (H2) Gear			178 *(80.8)*	54 *(12.2)*	60 *(15.6)*	28.860 *(97.460)*

LUGGING ABILITY IN 9th (H1) GEAR

Crankshaft Speed rpm	2599	2345	2078	1816	1560	1294
Pull—lbs *(kN)*	2740 *(12.19)*	3023 *(13.45)*	3182 *(14.15)*	3315 *(14.75)*	3375 *(15.01)*	3340 *(14.86)*
Increase in Pull %	0	10	16	21	23	22
Power—Hp *(kW)*	37.07 *(27.65)*	36.55 *(27.26)*	33.93 *(25.30)*	30.81 *(22.98)*	26.88 *(20.04)*	22.09 *(16.47)*
Speed—Mph *(km/h)*	5.07 *(8.17)*	4.53 *(7.30)*	4.00 *(6.44)*	3.49 *(5.61)*	2.99 *(4.81)*	2.48 *(3.99)*
Slip %	6.15	7.00	7.45	7.78	8.00	7.89

Department of Agricultural Engineering

Dates of Test: April 21-May 1, 1981

Manufacturer: FIAT TRATTORI S.p.A., Via Pico della Mirandola, 72-41100, Modena, Italy

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 46.3 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60°** ***(15°/15°)*** 0.8408 **Fuel weight** 7.001 lbs/gal *(0.839 kg/l)* **Oil SAE** 15W-40 **API service classification** SB/SE-CA/CD **To motor** 1.888 gal *(7.146 l)* **Drained from motor** 1.465 gal *(5.546 l)* **Transmission lubricant** SAE 15W-40 **Final drive lubricant** API 303 **Total time engine was operated** 39.5 hours

ENGINE Make U.T.B. Diesel **Type** three cylinder vertical **Serial No.** 8035.02309*002759* **Crankshaft** lengthwise **Rated rpm** 2600 **Bore and stroke** 3.937" × 4.33" *(100 mm × 110 mm)* **Compression ratio** 17 to 1 **Displacement** 158 cu in *(2592 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** oil bath with centrifugal precleaner **Oil filter** one full flow paper cartridge **Fuel filter** two paper elements **Muffler** horizontal **Cooling medium temperature control** one thermostat.

CHASSIS: Type front wheel assist **Serial No.** 480/8DT*973359* **Tread width** rear 51.2" *(1300 mm)* to 74.8" *(1900 mm)* front 55.1" *(1400 mm)* to 59.1" *(1500 mm)* **Wheel base** 78.7" *(2000 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 32.2" *(818 mm)* Vertical distance above roadway 31.3" *(794 mm)* Horizontal distance from center of rear wheel tread 0" *(0 mm)* to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph** ***(km/h)*** first 0.5 *(0.8)* second 0.7 *(1.1)* third 1.0 *(1.7)* fourth 1.3 *(2.2)* fifth 1.5 *(2.4)* sixth 2.2 *(3.5)* seventh 3.2 *(5.2)* eighth 4.2 *(6.7)* ninth 5.2 *(8.4)* tenth 7.9 *(12.7)* eleventh 11.6 *(18.6)* twelfth 14.9 *(24.0)* reverse 0.7 *(1.1)*, 2.1 *(3.4)*, 7.5 *(12.1)* **Clutch** single dry disc operated by foot pedal **Brakes** drum and shoe operated by two foot pedals which can be locked together and hand lever **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 168" *(4.27 m)* left 168" *(4.27 m)* (on concrete surface without brake) right 182" *(4.62 m)* left 184" *(4.67 m)* **Turning space diameter** (on concrete surface with brake applied) right 343" *(8.72 m)* left 344" *(8.74 m)* (on concrete surface without brake) right 372" *(9.44 m)* left 376" *(9.54 m)* **Power take-off** 540 rpm at 2160 engine rpm.

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump was 141°F *(60.7°C)*. Five gears were chosen between 15% slip and 10 mph *(16.1 km/h)*.

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)	Front Wheel Drive Disengaged dB(A)
Maximum Available Power—Two Hours	98.5	98.0
75% of Pull at Maximum Power—Ten Hours		96.5
50% of Pull at Maximum Power—Two Hours		96.0
50% of Pull at Reduced Engine Speed—Two Hours		92.0
Bystander in 12th (H4) gear		86.5

DRAWBAR PERFORMANCE
(Front Wheel Drive Engaged)

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr *(l/h)*	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Fuel Consumption Hp.hr/gal *(kW.h/l)*	Temp. °F (°C) Cooling med	Temp. °F (°C) Air wet bulb	Temp. °F (°C) Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power—Two Hours 9th (H1) Gear											
36.33 *(27.09)*	2613 *(11.62)*	5.21 *(8.39)*	2599	4.29	2.732 *(10.341)*	0.526 *(0.320)*	13.30 *(2.620)*	179 *(81.7)*	60 *(15.6)*	71 *(21.7)*	28.820 *(97.320)*
MAXIMUM POWER IN SELECTED GEARS											
33.60 *(25.06)*	6308 *(28.06)*	2.00 *(3.22)*	2677	14.80	6th (L2) Gear			177 *(80.3)*	51 *(10.6)*	58 *(14.4)*	28.960 *(97.790)*
37.53 *(27.99)*	2698 *(12.00)*	5.22 *(8.39)*	2601	4.32	9th (H1) Gear			178 *(80.8,*	54 *(12.2)*	59 *(15.0)*	28.880 *(97.520)*

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi *(kPa)*	Two 14.9-28; 6; 16 *(110)*	Two 14.9-28; 6; 16 *(110)*
Ballast	—Liquid (each)	442 lb *(201 kg)*	None
	—Cast Iron (each)	600 lb *(272 kg)*	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 8.3-24; 8; 22 *(150)*	Two 8.3-24; 8; 22 *(150)*
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	200 lb *(91 kg)*	None
Height of drawbar		18.5 in *(470 mm)*	18.5 in *(470 mm)*
Static Weight with Operator	—Rear	5230 lb *(2372 kg)*	3145 lb *(1426 kg)*
	Front	2575 lb *(1168 kg)*	2175 lb *(987 kg)*
	Total	7805 lb *(3540 kg)*	5320 lb *(2413 kg)*

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1385.**

LOUIS I. LEVITICUS
Engineer-in Charge

K. VON BARGEN
W. E. SPLINTER
L. L. BASHFORD
Board of Tractor Test Engineers

HESSTON 480 8 DT
1385

Hesston 480-8 DT Fiat Diesel

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Roy G. Arnold, Director

NEBRASKA TRACTOR TEST 1386 — HESSTON 780 DT FIAT DIESEL ALSO HESSTON 780 FIAT DIESEL
8 SPEED

POWER TAKE-OFF PERFORMANCE

Power Hp (kW)	Crank shaft speed rpm	Fuel Consumption gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temperature °F (°C) Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg (kPa)
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—606 rpm)								
70.57 *(52.62)*	2500	4.357 *(16.493)*	0.432 *(0.263)*	16.20 *(3.190)*	182 *(83.2)*	61 *(16.0)*	75 *(23.8)*	28.823 *(97.332)*
Standard Power take-off Speed (540 rpm)—One Hour								
66.67 *(49.72)*	2226	3.989 *(15.100)*	0.419 *(0.255)*	16.71 *(3.291)*	182 *(83.1)*	62 *(16.4)*	75 *(23.9)*	28.825 *(97.338)*
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
61.85 *(46.12)*	2576	3.745 *(14.176)*	0.424 *(0.258)*	16.52 *(3.253)*	173 *(78.3)*	62 *(16.7)*	75 *(23.9)*	......
0.00 *(0.00)*	2632	1.088 *(4.119)*	.....	.....	153 *(67.2)*	63 *(17.2)*	75 *(23.9)*	......
31.19 *(23.26)*	2598	2.314 *(8.759)*	0.520 *(0.316)*	13.48 *(2.656)*	162 *(71.9)*	63 *(17.2)*	75 *(23.9)*	......
70.83 *(52.82)*	2501	4.392 *(16.626)*	0.434 *(0.264)*	16.13 *(3.177)*	183 *(83.9)*	63 *(17.2)*	76 *(24.2)*	......
15.68 *(11.69)*	2614	1.645 *(6.227)*	0.735 *(0.447)*	9.53 *(1.877)*	155 *(68.3)*	63 *(17.2)*	75 *(23.9)*	......
46.32 *(34.54)*	2572	2.991 *(11.322)*	0.452 *(0.275)*	15.49 *(3.051)*	168 *(75.6)*	63 *(17.2)*	75 *(23.9)*	......
Av 37.65 ***Av (28.08)***	**2582**	**2.696** ***(10.205)***	**0.501** ***(0.305)***	**13.96** ***(2.752)***	**166** ***(74.2)***	**63** ***(17.1)***	**75** ***(23.9)***	**28.800** ***(97.258)***

DRAWBAR PERFORMANCE
(Front Wheel Drive Disengaged)

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temp °F (°C) Cooling med	Air wet bulb	Air dry bulb	Barom. inch Hg (kPa)
Maximum Available Power—Two Hours 5th (H1) Gear											
59.79 *(44.58)*	4373 *(19.45)*	5.13 *(8.25)*	2501	7.85	4.357 *(16.491)*	0.510 *(0.310)*	13.72 *(2.703)*	187 *(85.8)*	53 *(11.7)*	70 *(20.8)*	28.845 *(97.410)*
75% of Pull at Maximum Power—Ten Hours 5th (H1) Gear											
48.72 *(36.33)*	3383 *(15.05)*	5.40 *(8.69)*	2569	5.68	3.514 *(13.301)*	0.505 *(0.307)*	13.86 *(2.731)*	180 *(82.3)*	64 *(17.8)*	81 *(27.2)*	28.604 *(96.590)*
50% of Pull at Maximum Power—Two Hours 5th (H1) Gear											
33.50 *(24.98)*	2256 *(10.04)*	5.57 *(8.96)*	2608	4.15	2.732 *(10.341)*	0.571 *(0.347)*	12.26 *(2.416)*	166 *(74.4)*	67 *(19.2)*	74 *(23.1)*	28.695 *(96.900)*
50% of Pull at Reduced Engine Speed—Two Hours 6th (H2) Gear											
33.69 *(25.12)*	2268 *(10.09)*	5.57 *(8.97)*	1808	3.98	2.285 *(8.651)*	0.475 *(0.289)*	14.74 *(2.904)*	170 *(76.4)*	71 *(21.4)*	81 *(27.2)*	28.685 *(96.860)*
MAXIMUM POWER IN SELECTED GEARS											
53.36 *(39.79)*	6965 *(30.98)*	2.87 *(4.62)*	2543	14.99	3rd (L3) Gear			158 *(69.7)*	64 *(17.8)*	68 *(20.0)*	28.700 *(96.920)*
59.07 *(44.05)*	5806 *(25.83)*	3.82 *(6.14)*	2500	11.39	4th (L4) Gear			181 *(82.5)*	51 *(10.6)*	63 *(17.2)*	28.880 *(97.520)*
61.59 *(45.93)*	4507 *(20.05)*	5.13 *(8.26)*	2500	7.91	5th (H1) Gear			175 *(79.4)*	48 *(8.9)*	59 *(15.0)*	28.900 *(97.590)*
62.06 *(46.28)*	3058 *(13.60)*	7.61 *(12.25)*	2499	5.24	6th (H2) Gear			184 *(84.2)*	51 *(10.6)*	65 *(18.3)*	28.870 *(97.490)*

LUGGING ABILITY IN 5th (H1) GEAR

Crankshaft Speed rpm	2500	2253	2000	1746	1494	1246	1004
Pull—lbs *(kN)*	4507 *(20.05)*	4771 *(21.22)*	4947 *(22.00)*	5107 *(22.72)*	5159 *(22.95)*	5222 *(23.23)*	5218 *(23.21)*
Increase in Pull %	0	6	10	13	14	16	16
Power—Hp *(kW)*	61.59 *(45.93)*	58.38 *(43.54)*	53.44 *(39.85)*	47.98 *(35.78)*	41.39 *(30.86)*	34.88 *(26.01)*	27.97 *(20.86)*
Speed—Mph *(km/h)*	5.13 *(8.26)*	4.59 *(7.39)*	4.05 *(6.52)*	3.52 *(5.67)*	3.01 *(4.84)*	2.50 *(4.03)*	2.01 *(3.24)*
Slip %	7.91	8.60	8.98	9.47	9.59	9.83	9.96

Department of Agricultural Engineering

Dates of Test: April 21-29, 1981

Manufacturer: FIAT TRATTORI S.p.A., Via Pico della Mirandola, 72-41100, Modena, Italy

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 46.3 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60°** *(15°/15°)* 0.8408 **Fuel weight** 7.001 lbs/gal *(0.839 kg/l)* **Oil SAE** 15W-40 **API service classification** SB/SE-CA/CD **To motor** 2.684 gal *(10.160 l)* **Drained from motor** 2.287 gal *(8.657 l)* **Transmission lubricant** SAE 15W-40 **Final drive lubricant** API 303 **Total time engine was operated** 40.0 hours

ENGINE Make Fiat Diesel **Type** four cylinder vertical **Serial No.** 8045.04*377-799018 **Crankshaft** lengthwise **Rated rpm** 2500 **Bore and stroke** 4.055" × 4.33" *(103 mm × 110 mm)* **Compression ratio** 17 to 1 **Displacement** 224 cu in *(3666 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements **Oil filter** one full flow paper cartridge **Fuel filter** two paper elements **Muffler** vertical **Cooling medium temperature control** one thermostat.

CHASSIS: Type front wheel assist **Serial No.** 780DT/8*682310* **Tread width** rear 55.1" *(1400 mm)* to 82.7" *(2100 mm)* front 64.2" *(1630 mm)* to 77.0" *(1955 mm)* **Wheel base** 89.8" *(2280 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 33.8" *(859 mm)* Vertical distance above roadway 31.3" *(795 mm)* Horizontal distance from center of rear wheel tread 0" *(0 mm)* to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph *(km/h)*** first 1.5 *(2.4)* second 2.2 *(3.6)* third 3.3 *(5.3)* fourth 4.2 *(6.8)* fifth 5.5 *(8.9)* sixth 7.9 *(12.8)* seventh 11.8 *(19.1)* eighth 15.3 *(24.7)* reverse 2.0 *(3.2)*, 7.1 *(11.5)* **Clutch** dry double disc operated by foot pedal **Brakes** single wet disc hydraulically operated by two foot pedals which can be locked together and hand lever **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 191" *(4.85 m)* left 189" *(4.80 m)* (on concrete surface without brake) right 214" *(5.44 m)* left 213" *(5.41 m)* **Turning space diameter** (on concrete surface with brake applied) right 393" *(9.98 m)* left 389" *(9.88 m)* (on concrete surface without brake) right 438" *(11.13 m)* left 436" *(11.07 m)* **Power take-off** 540 rpm at 2226 engine rpm.

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump was 139°F *(59.5°C)*. Four gears were chosen between 15% slip and 10 mph *(16.1 km/h)*.

TRACTOR SOUND LEVEL WITHOUT CAB	**dB(A)**	**Front Wheel Drive Disengaged dB(A)**
Maximum Available Power—Two Hours	97.0	97.5
75% of Pull at Maximum Power—Ten Hours		96.0
50% of Pull at Maximum Power—Two Hours		94.0
50% of Pull at Reduced Engine Speed—Two Hours		91.0
Bystander in 8th (H4) gear		89.5

DRAWBAR PERFORMANCE (Front Wheel Drive Engaged)

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr *(l/h)*	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Fuel Consumption Hp.hr/gal *(kW.h/l)*	Temp. °F (°C) Cool-ing med	Temp. °F (°C) Air wet bulb	Temp. °F (°C) Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power—Two Hours 5th (H1) Gear											
59.97 *(44.72)*	4275 *(19.02)*	5.26 *(8.47)*	2499	6.00	4.357 *(16.491)*	0.509 *(0.309)*	13.77 *(2.712)*	190 *(87.8)*	56 *(13.1)*	74 *(23.1)*	28.805 *(97.270)*
MAXIMUM POWER IN SELECTED GEARS											
43.15 *(32.18)*	8210 *(36.52)*	1.97 *(3.17)*	2583	14.87	2nd (L2) Gear			151 *(65.8)*	62 *(16.7)*	67 *(19.4)*	28.690 *(96.880)*
61.95 *(46.20)*	4420 *(19.66)*	5.26 *(8.46)*	2500	6.16	5th (H1) Gear			179 *(81.7)*	50 *(10.0)*	62 *(16.7)*	28.890 *(97.560)*

TIRES, BALLAST AND WEIGHT		**With Ballast**	**Without Ballast**
Rear Tires	—No., size, ply & psi *(kPa)*	Two 18.4-30; 6; 16 *(110)*	Two 18.4-30; 6; 16 *(110)*
Ballast	—Liquid (each)	950 lb *(431 kg)*	None
	—Cast Iron (each)	710 lb *(322 kg)*	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 12.4-24; 6, 22 *(150)*	Two 12.4-24; 6; 22 *(150)*
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	300 lb *(136 kg)*	None
Height of drawbar		19.5 in *(495 mm)*	19.5 in *(495 mm)*
Static Weight with Operator	—Rear	7175 lb *(3255 kg)*	3855 lb *(1749 kg)*
	Front	2925 lb *(1327 kg)*	2325 lb *(1054 kg)*
	Total	10100 lb *(4581 kg)*	6180 lb *(2803 kg)*

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. 1386.

LOUIS I. LEVITICUS
Engineer-in Charge

K. VON BARGEN
W. E. SPLINTER
L. L. BASHFORD
Board of Tractor Test Engineers

HESSTON 780 DT

Hesston 780 DT Fiat Diesel

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska-Lincoln
Roy G. Arnold, Director

NEBRASKA TRACTOR TEST 1387 — INTERNATIONAL 284 DIESEL 8 SPEED

POWER TAKE-OFF PERFORMANCE

Power Hp (kW)	Crank shaft speed rpm	Fuel Consumption gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temperature °F (°C) Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg (kPa)
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—650 rpm)								
27.47 (20.48)	2600	1.963 (7.431)	0.500 (0.304)	14.00 (2.756)	177 (80.7)	62 (16.6)	75 (23.9)	29.090 (98.233)
Standard Power take-off Speed (540 rpm)—One Hour								
23.92 (17.84)	2160	1.661 (6.288)	0.486 (0.296)	14.40 (2.837)	178 (80.9)	62 (16.7)	75 (24.1)	29.075 (98.182)
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
23.53 (17.55)	2622	1.744 (6.602)	0.519 (0.316)	13.49 (2.658)	171 (77.2)	62 (16.7)	76 (24.2)	....
0.00 (0.00)	2719	0.724 (2.741)	....	....	154 (67.8)	62 (16.7)	76 (24.4)	....
12.03 (8.97)	2676	1.183 (4.478)	0.688 (0.419)	10.17 (2.003)	160 (70.8)	61 (16.1)	75 (23.6)	....
28.16 (21.00)	2599	1.997 (7.559)	0.497 (0.302)	14.10 (2.778)	182 (83.1)	62 (16.4)	75 (23.9)	....
6.04 (4.50)	2695	0.934 (3.536)	1.082 (0.658)	6.47 (1.273)	155 (68.3)	62 (16.4)	75 (23.6)	....
17.95 (13.39)	2666	1.457 (5.515)	0.568 (0.346)	12.32 (2.428)	161 (71.7)	61 (16.1)	75 (23.6)	....
Av 14.62 **Av (10.98)**	**2663**	**1.340** **(5.072)**	**0.642** **(0.390)**	**10.91** **(2.149)**	**164** **(73.2)**	**62** **(16.4)**	**75** **(23.9)**	**29.047** **(98.086)**

DRAWBAR PERFORMANCE

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temp. °F (°C) Cool-ing med	Air wet bulb	Air dry bulb	Barom. inch Hg (kPa)
Maximum Available Power—Two Hours 7th (H-3) Gear											
21.98 (16.39)	1448 (6.44)	5.69 (9.16)	2596	8.35	2.000 (7.570)	0.637 (0.387)	10.99 (2.165)	171 (77.2)	48 (8.6)	57 (13.6)	28.985 (97.880)
75% of Pull at Maximum Power—Ten Hours 7th (H-3) Gear											
18.32 (13.66)	1163 (5.17)	5.91 (9.51)	2636	6.32	1.739 (6.583)	0.665 (0.404)	10.53 (2.075)	170 (76.1)	55 (12.9)	62 (16.7)	28.740 (97.050)
50% of Pull at Maximum Power—Two Hours 7th (H-3) Gear											
12.78 (9.53)	785 (3.49)	6.11 (9.83)	2673	4.50	1.393 (5.272)	0.763 (0.464)	9.18 (1.808)	167 (75.0)	50 (9.7)	58 (14.4)	28.930 (97.690)
50% of Pull at Reduced Engine Speed—Two Hours 8th (H-4) Gear											
12.73 (9.49)	780 (3.47)	6.12 (9.85)	1799	4.43	1.125 (4.258)	0.619 (0.376)	11.32 (2.229)	166 (74.4)	50 (10.0)	57 (13.9)	28.910 (97.620)
MAXIMUM POWER IN SELECTED GEARS											
20.05 (14.95)	2523 (11.22)	2.98 (4.80)	2633	14.91	5th (H-1) Gear			169 (75.8)	45 (7.2)	56 (13.3)	28.960 (97.790)
22.73 (16.95)	2181 (9.70)	3.91 (6.29)	2597	12.59	6th (H-2) Gear			170 (76.4)	45 (7.2)	52 (11.1)	29.020 (98.000)
23.52 (17.54)	1545 (6.87)	5.71 (9.19)	2602	8.30	7th (H-3) Gear			169 (75.8)	44 (6.7)	50 (10.0)	29.030 (98.030)
22.84 (17.03)	978 (4.35)	8.76 (14.09)	2599	5.31	8th (H-4) Gear			170 (76.7)	46 (7.8)	53 (11.7)	29.020 (98.000)

LUGGING ABILITY IN 7th (H-3) GEAR

Crankshaft Speed rpm	2602	2349	2081	1824	1559	1300
Pull—lbs (kN)	1545 (6.87)	1636 (7.28)	1690 (7.52)	1701 (7.57)	1698 (7.55)	1641 (7.30)
Increase in Pull %	0	6	9	10	10	6
Power—Hp (kW)	23.52 (17.54)	22.35 (16.66)	20.40 (15.21)	17.99 (13.41)	15.34 (11.44)	12.40 (9.25)
Speed—Mph (km/h)	5.71 (9.19)	5.12 (8.24)	4.53 (7.28)	3.97 (6.38)	3.39 (5.45)	2.83 (4.56)
Slip %	8.30	8.88	9.05	9.32	9.23	8.88

Department of Agricultural Engineering

Dates of Test: April 30 to May 12, 1981

Manufacturer: INTERNATIONAL HARVESTER CO., 401 North Michigan Avenue, Chicago, Illinois 60611

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 46.3 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60°** *(15°/15°)* 0.8408 **Fuel weight** 7.001 lbs/gal *(0.839 kg/l)* **Oil SAE** 30 **API service classification** CA/CD-SC/SE **To motor** 0.994 gal *(3.763 l)* **Drained from motor** 0.890 gal *(3.369 l)* **Transmission and final drive lubricant** I.H. Hytran fluid **Total time engine was operated** 46.0 hours

ENGINE Make Nissan Diesel **Type** three cylinder vertical **Serial No.** SD 16-003704 **Crankshaft** lengthwise **Rated rpm** 2600 **Bore and stroke** 3.27" × 3.94" *(83 mm × 100 mm)* **Compression ratio** 20.8 to 1 **Displacement** 99 cu in *(1622 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** one paper element **Oil filter** one full flow paper cartridge **Fuel filter** one paper element **Muffler** vertical **Cooling medium temperature control** one thermostat.

CHASSIS: Type standard **Serial No.** 2020002J001906* **Tread width** rear 41.5" *(1055 mm)* to 57.9" *(1470 mm)* front 39.4" *(1000 mm)* to 61.8" *(1570 mm)* **Wheel base** 63.0" *(1600 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 22.8" *(579 mm)* Vertical distance above roadway 26.0" *(660 mm)* Horizontal distance from center of rear wheel tread 0" *(0 mm)* to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph** *(km/h)* first 1.0 *(1.6)* second 1.3 *(2.0)* third 1.8 *(2.8)* fourth 2.6 *(4.2)* fifth 3.5 *(5.6)* sixth 4.5 *(7.2)* seventh 6.2 *(10.0)* eighth 9.3 *(14.9)* reverse 1.8 *(2.8)*, 6.2 *(10.0)* **Clutch** single dry disc operated by foot pedal **Brakes** single wet disc hydraulically operated by two foot pedals which can be locked together **Steering** power assist **Turning radius** (on concrete surface with brake applied) right 98.4" *(2.50 m)* left 98.4" *(2.50 m)* (on concrete surface without brake) right 113.1" *(2.87 m)* left 113.1" *(2.87 m)* **Turning space diameter** (on concrete surface with brake applied) right 202.3" *(5.14 m)* left 202.3" *(5.14 m)* (on concrete surface without brake) right 231.7" *(5.88 m)* left 231.7" *(5.88 m)* **Power take-off** 540 rpm at 2160 engine rpm.

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)
Maximum Available Power—Two Hours	94.5
75% of Pull at Maximum Power—Ten Hours	92.0
50% of Pull at Maximum Power—Two Hours	91.5
50% of Pull at Reduced Engine Speed—Two Hours	88.5
Bystander in 8th (H-4) gear	80.0

TIRES, BALLAST AND WEIGHT		**With Ballast**	**Without Ballast**
Rear Tires	—No., size, ply & psi *(kPa)*	Two 11.2/10-24; 4; 14 *(95)*	Two 11.2/10-24; 4; 14 *(95)*
Ballast	—Liquid (each)	295 lb *(134 kg)*	None
	—Cast Iron (each)	98 lb *(44 kg)*	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 5.00-15; 4; 40 *(275)*	Two 5.00-15; 4; 40 *(275)*
Ballast	—Liquid (each)	None	None
	—Test Equip. (each)	37 lb *(17 kg)*	None
Height of drawbar		15.5 in *(395 mm)*	15.5 in *(395 mm)*
Static Weight with Operator	—Rear	2595 lb *(1177 kg)*	1810 lb *(821 kg)*
	Front	1005 lb *(456 kg)*	930 lb *(422 kg)*
	Total	3600 lb *(1633 kg)*	2740 lb *(1243 kg)*

procedure. Temperature at injection pump return was 135°F *(57.3°C)*. Four gears were chosen between 15% slip and 10 mph *(16.1 km/h)*.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1387.**

LOUIS I. LEVITICUS
Engineer-in Charge

K. VON BARGEN
W. E. SPLINTER
L. L. BASHFORD
Board of Tractor Test Engineers

International 284 Diesel

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Roy G. Arnold, Director

NEBRASKA TRACTOR TEST 1388 — INTERNATIONAL 786 DIESEL 16 SPEED

POWER TAKE-OFF PERFORMANCE

Power Hp *(kW)*	Crank shaft speed rpm	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temperature °F (°C) Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg *(kPa)*
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—1158 rpm)								
80.20 *(59.81)*	2400	5.373 *(20.339)*	0.469 *(0.285)*	14.93 *(2.941)*	176 *(80.2)*	58 *(14.4)*	75 *(23.8)*	28.983 *(97.872)*
Standard Power take-off Speed (1000 rpm)—One Hour								
77.41 *(57.72)*	2072	4.923 *(18.636)*	0.445 *(0.271)*	15.72 *(3.097)*	177 *(80.6)*	58 *(14.7)*	75 *(23.9)*	28.960 *(97.794)*
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
71.92 *(53.63)*	2534	5.077 *(19.219)*	0.494 *(0.301)*	14.17 *(2.790)*	174 *(78.9)*	59 *(14.7)*	75 *(23.9)*	....
0.00 *(0.00)*	2652	2.099 *(7.946)*	....	....	169 *(76.1)*	59 *(14.7)*	74 *(23.3)*	....
36.80 *(27.44)*	2582	3.445 *(13.041)*	0.655 *(0.399)*	10.68 *(2.104)*	171 *(77.2)*	59 *(15.0)*	75 *(23.9)*	....
80.27 *(59.86)*	2401	5.386 *(20.388)*	0.470 *(0.286)*	14.90 *(2.936)*	176 *(79.7)*	59 *(15.0)*	75 *(23.9)*	....
18.64 *(13.90)*	2617	2.755 *(10.429)*	1.035 *(0.629)*	6.77 *(1.333)*	169 *(76.1)*	59 *(15.0)*	75 *(23.6)*	....
54.51 *(40.65)*	2564	4.237 *(16.039)*	0.544 *(0.331)*	12.86 *(2.534)*	172 *(77.8)*	59 *(15.0)*	75 *(23.9)*	....
Av 43.69 ***Av (32.58)***	**2558**	**3.833** ***(14.509)***	**0.614** ***(0.374)***	**11.40** ***(2.246)***	**172** ***(77.7)***	**59** ***(14.9)***	**75** ***(23.8)***	**28.925** ***(97.675)***

DRAWBAR PERFORMANCE

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temp. °F (°C) Cooling med	Air wet bulb	Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power—Two Hours 8th (1st Hi TA) Gear											
69.04 *(51.49)*	5463 *(24.30)*	4.74 *(7.63)*	2399	4.82	5.428 *(20.546)*	0.550 *(0.335)*	12.72 *(2.506)*	183 *(83.6)*	57 *(13.9)*	67 *(19.2)*	29.050 *(98.100)*
75% of Pull at Maximum Power—Ten Hours 8th (1st Hi TA) Gear											
56.15 *(41.87)*	4169 *(18.54)*	5.05 *(8.13)*	2523	3.58	4.728 *(17.897)*	0.590 *(0.359)*	11.88 *(2.340)*	181 *(82.7)*	56 *(13.4)*	60 *(15.6)*	28.770 *(97.150)*
50% of Pull at Maximum Power—Two Hours 8th (1st Hi TA) Gear											
38.22 *(28.50)*	2787 *(12.40)*	5.14 *(8.28)*	2540	2.50	3.821 *(14.464)*	0.700 *(0.426)*	10.00 *(1.970)*	179 *(81.7)*	50 *(9.7)*	54 *(11.9)*	29.120 *(98.330)*
50% of Pull at Reduced Engine Speed—Two Hours 12th (2nd Hi DD) Gear											
38.29 *(28.56)*	2788 *(12.40)*	5.15 *(8.29)*	1491	2.42	2.946 *(11.152)*	0.539 *(0.328)*	13.00 *(2.561)*	179 *(81.7)*	54 *(11.9)*	62 *(16.7)*	29.095 *(98.250)*
MAXIMUM POWER IN SELECTED GEARS											
57.78 *(43.08)*	9968 *(44.34)*	2.17 *(3.50)*	2514	14.59	4th (2nd Lo DD) Gear			181 *(82.5)*	54 *(12.2)*	62 *(16.7)*	29.080 *(98.200)*
67.44 *(50.29)*	8406 *(37.39)*	3.01 *(4.84)*	2401	8.64	5th (3rd Lo TA) Gear			182 *(83.1)*	54 *(12.2)*	69 *(20.6)*	28.990 *(97.890)*
68.40 *(51.00)*	6452 *(28.70)*	3.98 *(6.40)*	2400	5.85	6th (3rd Lo DD) Gear			182 *(83.3)*	54 *(12.2)*	69 *(20.6)*	28.990 *(97.890)*
68.60 *(51.15)*	6202 *(27.59)*	4.15 *(6.67)*	2400	5.64	7th (4th Lo TA) Gear			182 *(83.3)*	54 *(12.2)*	69 *(20.6)*	28.990 *(97.890)*
70.25 *(52.39)*	5556 *(24.72)*	4.74 *(7.63)*	2401	4.85	8th (1st Hi TA) Gear			183 *(83.9)*	53 *(11.7)*	68 *(20.0)*	29.010 *(97.960)*
68.93 *(51.40)*	4788 *(21.30)*	5.40 *(8.69)*	2400	4.06	9th (4th Lo DD) Gear			182 *(83.3)*	55 *(12.8)*	70 *(21.1)*	28.980 *(97.860)*
69.93 *(52.15)*	4259 *(18.95)*	6.16 *(9.91)*	2399	3.54	10th (1st Hi DD) Gear			182 *(83.3)*	55 *(12.8)*	70 *(21.1)*	28.980 *(97.860)*
70.15 *(52.31)*	4116 *(18.31)*	6.39 *(10.29)*	2398	3.47	11th (2nd Hi TA) Gear			183 *(83.6)*	55 *(12.8)*	70 *(21.1)*	28.980 *(97.860)*
68.66 *(51.20)*	3112 *(13.84)*	8.27 *(13.31)*	2399	2.57	12th (2nd Hi DD) Gear			183 *(83.9)*	55 *(12.8)*	70 *(21.1)*	28.970 *(97.830)*

Department of Agricultural Engineering

Dates of Test: April 30 to May 11, 1981

Manufacturer: INTERNATIONAL HARVESTER CO., 401 North Michigan Avenue, Chicago, Illinois 60611

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 46.3 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60°** *(15°/15°)* 0.8408 **Fuel weight** 7.001 lbs/gal *(0.839 kg/l)* **Oil SAE** 30 **API service classification** CA/CD-SC/SE **To motor** 2.727 gal *(10.323 l)* **Drained from motor** 2.608 gal *(9.872 l)* **Transmission and final drive lubricant** I. H. Hytran fluid **Total time engine was operated** 41.5 hours

ENGINE Make International Diesel **Type** six cylinder vertical **Serial No.** 358DT2D095334* **Crankshaft** lengthwise **Rated rpm** 2400 **Bore and stroke** 3.875" × 5.0625" *(98.4 mm × 128.6 mm)* **Compression ratio** 14.8 to 1 **Displacement** 358 cu in *(5868 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** two paper cartridges **Muffler** underhood **Exhaust** vertical **Cooling medium temperature control** one thermostat.

CHASSIS: Type standard with duals **Serial No.** 2470001U009083* **Tread width** rear 66" *(1676 mm)* to 113.5" *(2883 mm)* front 60" *(1520 mm)* to 84" *(2130 mm)* **Wheel base** 104.8" *(2662 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 29.8" *(757 mm)* Vertical distance above roadway 37.7" *(958 mm)* Horizontal distance from center of rear wheel tread 0" *(0 mm)* to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial (2) range operator controlled powershift **Advertised speeds mph *(km/h)*** first 1.4 *(2.2)* second 1.8 *(2.8)* third 1.8 *(3.0)* fourth 2.4 *(3.8)* fifth 3.2 *(5.1)* sixth 4.1 *(6.6)* seventh 4.2 *(6.8)* eighth 4.8 *(7.8)* ninth 5.4 *(8.8)* tenth 6.2 *(10.0)* eleventh 6.4 *(10.3)* twelfth 8.2 *(13.2)* thirteenth 11.1 *(17.9)* fourteenth 14.3 *(23.0)* fifteenth 14.9 *(23.9)* sixteenth 19.1 *(30.7)* reverse 2.4 *(3.8)*, 3.0 *(4.9)*, 3.2 *(5.1)*, 4.0 *(6.5)*, 5.5 *(8.8)*, 7.0 *(11.3)*, 7.3 *(11.7)*, 9.4 *(15.1)* **Clutch** single dry disc operated by foot pedal with hydraulic power assist **Brakes** multiple wet disc hydraulically power actuated and operated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 142.8" *(3.63 m)* left 142.8" *(3.63 m)* (on concrete surface without brake) right 174.6" *(4.43 m)* left 174.6" *(4.43 m)* **Turning space diameter** (on concrete surface with brake applied) right 301.4" *(7.66 m)* left 301.4" *(7.66 m)* (on concrete surface without brake) right 365.2" *(9.28 m)*

LUGGING ABILITY IN 8th (1st Hi TA) GEAR

Crankshaft Speed rpm	2401	2163	1918	1677	1433	1202	965
Pull—lbs	5556	6150	6482	6767	7005	7072	6978
(kN)	*(24.72)*	*(27.36)*	*(28.83)*	*(30.10)*	*(31.16)*	*(31.46)*	*(31.04)*
Increase in Pull %	0	11	17	22	26	27	26
Power—Hp	70.25	69.61	64.77	58.93	51.91	43.93	34.79
(kW)	*(52.39)*	*(51.91)*	*(48.30)*	*(43.94)*	*(38.71)*	*(32.76)*	*(25.94)*
Speed—Mph	4.74	4.24	3.75	3.27	2.78	2.33	1.87
(km/h)	*(7.63)*	*(6.83)*	*(6.03)*	*(5.26)*	*(4.47)*	*(3.75)*	*(3.01)*
Slip %	4.85	5.35	5.78	6.20	6.48	6.61	6.75

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)
Maximum Available Power—Two Hours	91.5
75% of Pull at Maximum Power—Ten Hours	92.5
50% of Pull at Maximum Power—Two Hours	93.0
50% of Pull at Reduced Engine Speed—Two Hours	91.0
Bystander in 15th (4 HiTA) gear	89.5

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi *(kPa)*	Four 18.4-34; 6; 12 *(85)*	Four 18.4-34; 6; 12 *(85)*
Ballast	—Liquid (each)	None	None
	—Test Equip. (each)	61 lb *(28 kg)*	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 11L-15; 6; 32 *(220)*	Two 11L-15; 6; 32 *(220)*
Ballast	—Liquid (each)	None	None
	—Test Equip. (each)	48 lb *(22 kg)*	None
Height of Drawbar		19.5 in *(495 mm)*	19.5 in *(495 mm)*
Static Weight with Operator	—Rear	8610 lb *(3905 kg)*	8365 lb *(3794 kg)*
	Front	3320 lb *(1506 kg)*	3225 lb *(1463 kg)*
	Total	11930 lb *(5411 kg)*	11590 lb *(5257 kg)*

left 365.2″ *(9.28 m)* **Power take-off** 1000 rpm at 2072 engine rpm and 540 rpm at 2106 engine rpm.

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump was 132°F *(55.6°C)*. Nine gears were chosen between 15% slip and 10 mph *(16.1 km/h)*.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1388.**

LOUIS I. LEVITICUS
Engineer-in Charge

K. VON BARGEN
W. E. SPLINTER
L. L. BASHFORD
Board of Tractor Test Engineers

786
INTERNATIONAL

International 786 Diesel

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Roy G. Arnold, Director

NEBRASKA TRACTOR TEST 1389 — MASSEY FERGUSON MF 2775 DIESEL 8 SPEED

POWER TAKE-OFF PERFORMANCE

Power Hp *(kW)*	Crank shaft speed rpm	Fuel Consumption			Temperature °F *(°C)*			
		gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg *(kPa)*
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—1243 rpm)								
162.09 *(120.87)*	2600	11.054 *(41.844)*	0.478 *(0.291)*	14.66 *(2.889)*	185 *(85.2)*	61 *(16.1)*	75 *(23.9)*	28.893 *(97.568)*
Standard Power take-off Speed (1000 rpm)—One Hour								
146.87 *(109.52)*	2091	9.309 *(35.238)*	0.444 *(0.270)*	15.78 *(3.108)*	187 *(86.1)*	61 *(15.9)*	75 *(23.7)*	28.920 *(97.659)*
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
141.05 *(105.18)*	2664	10.039 *(38.002)*	0.499 *(0.303)*	14.05 *(2.768)*	183 *(83.9)*	61 *(16.1)*	75 *(23.9)*	....
0.00 *(0.00)*	2813	4.388 *(16.610)*	....	....	175 *(79.2)*	61 *(15.8)*	74 *(23.3)*	....
73.01 *(54.44)*	2752	7.033 *(26.623)*	0.675 *(0.411)*	10.38 *(2.045)*	180 *(81.9)*	61 *(15.8)*	75 *(23.6)*	....
163.37 *(121.82)*	2599	11.113 *(42.067)*	0.477 *(0.290)*	14.70 *(2.896)*	186 *(85.3)*	62 *(16.4)*	76 *(24.2)*	....
36.77 *(27.42)*	2784	5.655 *(21.407)*	1.078 *(0.656)*	6.50 *(1.281)*	176 *(80.0)*	62 *(16.4)*	75 *(23.6)*	....
107.73 *(80.33)*	2710	8.433 *(31.922)*	0.549 *(0.334)*	12.77 *(2.516)*	181 *(82.8)*	62 *(16.7)*	76 *(24.2)*	....
Av 86.99 ***Av (64.87)***	**2720**	**7.777** ***(29.439)***	**0.627** ***(0.381)***	**11.19** ***(2.204)***	**180** ***(82.2)***	**61** ***(16.2)***	**75** ***(23.8)***	**28.943** ***(97.737)***

DRAWBAR PERFORMANCE

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption			Temp. °F *(°C)*			
					gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Cool-ing med	Air wet bulb	Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power—Two Hours 5th Gear											
136.54 *(101.82)*	8924 *(39.69)*	5.74 *(9.23)*	2599	5.19	10.970 *(41.524)*	0.563 *(0.342)*	12.45 *(2.452)*	188 *(86.7)*	66 *(18.9)*	77 *(25.0)*	28.800 *(97.250)*
75% of Pull at Maximum Power—Ten Hours 5th Gear											
110.42 *(82.34)*	6860 *(30.51)*	6.04 *(9.71)*	2694	3.71	9.457 *(35.799)*	0.600 *(0.365)*	11.68 *(2.300)*	184 *(84.6)*	64 *(17.5)*	74 *(23.4)*	28.842 *(97.400)*
50% of Pull at Maximum Power—Two Hours 5th Gear											
76.21 *(56.83)*	4568 *(20.32)*	6.26 *(10.07)*	2759	2.50	7.973 *(30.181)*	0.733 *(0.446)*	9.56 *(1.883)*	182 *(83.1)*	65 *(18.3)*	70 *(21.1)*	28.815 *(97.300)*
50% of Pull at Reduced Engine Speed—Two Hours 6th Gear											
76.47 *(57.03)*	4578 *(20.36)*	6.26 *(10.08)*	1992	2.66	6.279 *(23.767)*	0.575 *(0.350)*	12.18 *(2.399)*	183 *(83.6)*	67 *(19.2)*	72 *(22.2)*	28.805 *(97.270)*
MAXIMUM POWER IN SELECTED GEARS											
99.67 *(74.33)*	16766 *(74.58)*	2.23 *(3.59)*	2709	14.92	2nd Gear			183 *(83.9)*	64 *(17.8)*	67 *(19.4)*	28.820 *(97.320)*
132.00 *(98.43)*	15079 *(67.07)*	3.28 *(5.28)*	2600	10.96	3rd Gear			186 *(85.3)*	63 *(17.2)*	69 *(20.6)*	28.580 *(96.510)*
138.34 *(103.16)*	10565 *(46.99)*	4.91 *(7.90)*	2600	6.39	4th Gear			188 *(86.7)*	67 *(19.4)*	80 *(26.7)*	28.800 *(97.250)*
139.68 *(104.16)*	9139 *(40.65)*	5.73 *(9.22)*	2599	5.23	5th Gear			188 *(86.7)*	66 *(18.9)*	76 *(24.4)*	28.790 *(97.220)*
135.51 *(101.05)*	6272 *(27.90)*	8.10 *(13.04)*	2601	3.40	6th Gear			186 *(85.3)*	64 *(17.8)*	70 *(21.1)*	28.570 *(96.480)*

LUGGING ABILITY IN 5th GEAR

Crankshaft Speed rpm	2599	2340	2083	1818	1559	1293
Pull—lbs *(kN)*	9139 *(40.65)*	9802 *(43.60)*	10362 *(46.09)*	10611 *(47.20)*	10680 *(47.51)*	10626 *(47.27)*
Increase in Pull %	0	7	13	16	17	16
Power—Hp *(kW)*	139.68 *(104.16)*	134.28 *(100.13)*	125.80 *(93.81)*	112.17 *(83.65)*	96.74 *(72.14)*	79.83 *(59.53)*
Speed—Mph *(km/h)*	5.73 *(9.22)*	5.14 *(8.27)*	4.55 *(7.33)*	3.96 *(6.38)*	3.40 *(5.47)*	2.82 *(4.53)*
Slip %	5.23	5.70	6.01	6.16	6.32	6.32

Department of Agricultural Engineering

Dates of Test: May 13-June 1, 1981

Manufacturer: MASSEY FERGUSON, INC.,
1901 Bell Avenue, Des Moines, Iowa 50315

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 46.3 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60°** *(15°/15°)* 0.8417 **Fuel weight** 7.008 lbs/gal *(0.840 kg/l)* **Oil SAE** 20W-20 **API service classification** SE-SF, CC **To motor** 5.056 gal *(19.139 l)* **Drained from motor** 4.319 gal *(16.349 l)* **Transmission and final drive lubricant** M. F. Permatran Fluid **Total time engine was operated** 40.5 hours

ENGINE: Make Perkins Diesel **Type** eight cylinder vee **Serial No.** ZA31067U512373G **Crankshaft** lengthwise **Rated rpm** 2600 **Bore and stroke** 4.63" × 4.75" *(117.6 mm × 120.7 mm)* **Compression ratio** 16 to 1 **Displacement** 640 cu in *(10484 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements with aspirator **Oil filter** two full flow spin on cartridges **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** two paper elements **Muffler** vertical **Cooling medium temperature control** 4 thermostats.

CHASSIS: Type standard with duals **Serial No.** 9R 010434 **Tread width** rear 71" *(1803 mm)* to 126" *(3200 mm)* front 60" *(1524 mm)* to 80" *(2032 mm)* **Wheel base** 110" *(2794 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 34.0" *(864 mm)* Vertical distance above roadway 40.6" *(1031 mm)* Horizontal distance from center of rear wheel tread 0" *(0 mm)* to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph *(km/h)*** first 1.8 *(2.8)* second 2.5 *(4.0)* third 3.6 *(5.8)* fourth 5.0 *(8.0)* fifth 5.9 *(9.5)* sixth 8.2 *(13.2)* seventh 12.0 *(19.3)* eighth 17.1 *(27.5)* reverse 2.1 *(3.4)*, 2.9 *(4.7)*, 4.2 *(6.8)*, 6.0 *(9.6)*, 6.9 *(11.1)*, 9.6 *(15.5)*, **Clutch** dual dry disc operated by foot pedal **Brakes** single wet disc hydraulically power actuated and operated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 152" *(3.86 m)* left 152" *(3.86 m)* (on concrete surface without brake) right 202" *(5.13 m)* left 202" *(5.13 m)* **Turning space diameter** (on concrete surface with brake applied) right 330" *(8.38 m)* left 330" *(8.38 m)* (on concrete surface without brake) right 428" *(10.87 m)* left 428" *(10.87 m)* **Power take-off** 1000 rpm at 2091 engine rpm.

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)
Maximum Available Power—Two Hours	102.0
75% of Pull at Maximum Power—Ten Hours	101.5
50% of Pull at Maximum Power—Two Hours	101.5
50% of Pull at Reduced Engine Speed—Two Hours	99.0
Bystander in 8th gear	96.0

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi *(kPa)*	Four 20.8-38; 10; 14 *(95)*	Four 20.8-38; 10; 14 *(95)*
Ballast	—Liquid (each inner)	1143 lb *(518 kg)*	None
	—Cast Iron (each inner)	1000 lb *(454 kg)*	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 14L-16.1; 6; 28 *(195)*	Two 14L-16.1; 6; 28 *(195)*
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	40 lb *(18 kg)*	None
Height of Drawbar		22 in *(560 mm)*	22 in *(560 mm)*
Static Weight with Operator—Rear		15205 lb *(6897 kg)*	10920 lb *(4953 kg)*
Front		4965 lb *(2252 kg)*	4885 lb *(2216 kg)*
Total		20170 lb *(9149 kg)*	15805 lb *(7169 kg)*

procedure. Temperature at injection pump return was 164°F *(73.2°C)*. Five gears were chosen between 15% slip and 10 mph *(16.1 km/h)*.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1389.**

LOUIS I. LEVITICUS
Engineer-in Charge

K. VON BARGEN
W. E. SPLINTER
L. L. BASHFORD
Board of Tractor Test Engineers

Massey Ferguson MF 2775 Diesel

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Roy G. Arnold, Director

NEBRASKA TRACTOR TEST 1391 — MASSEY FERGUSON MF 4900 DIESEL 18 SPEED

POWER TAKE-OFF PERFORMANCE

Power Hp *(kW)*	Crank shaft speed rpm	Fuel Consumption			Temperature °F *(°C)*			
		gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg *(kPa)*
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—1107 rpm)								
320.55 *(239.03)*	2600	20.452 *(77.419)*	0.447 *(0.272)*	15.67 *(3.087)*	169 *(76.2)*	60 *(15.3)*	75 *(23.8)*	28.877 *(97.512)*
Standard Power take-off Speed (1000 rpm)—One Hour								
323.83 *(241.52)*	2347	19.280 *(72.983)*	0.417 *(0.253)*	16.80 *(3.309)*	170 *(76.4)*	60 *(15.6)*	76 *(24.2)*	28.870 *(97.490)*
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
280.51 *(209.18)*	2678	18.971 *(71.813)*	0.473 *(0.288)*	14.78 *(2.913)*	169 *(75.8)*	60 *(15.3)*	75 *(23.9)*	....
0.00 *(0.00)*	2813	6.888 *(26.074)*	....	....	165 *(73.9)*	59 *(15.0)*	75 *(23.6)*	....
143.96 *(107.35)*	2746	13.669 *(51.743)*	0.665 *(0.404)*	10.53 *(2.075)*	167 *(75.0)*	59 *(15.0)*	76 *(24.2)*	....
321.31 *(239.60)*	2600	20.129 *(76.197)*	0.439 *(0.267)*	15.96 *(3.144)*	171 *(76.9)*	59 *(14.7)*	76 *(24.2)*	....
72.49 *(54.06)*	2770	10.712 *(40.549)*	1.034 *(0.629)*	6.77 *(1.333)*	166 *(74.2)*	60 *(15.6)*	77 *(25.0)*	....
213.49 *(159.20)*	2716	15.967 *(60.442)*	0.523 *(0.318)*	13.37 *(2.634)*	169 *(75.8)*	60 *(15.3)*	76 *(24.4)*	....
Av 171.96 ***Av (128.23)***	**2720**	**14.389** ***(54.468)***	**0.586** ***(0.356)***	**11.95** ***(2.354)***	**168** ***(75.3)***	**59** ***(15.2)***	**76** ***(24.2)***	**28.850** ***(97.422)***

DRAWBAR PERFORMANCE

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption			Temp. °F *(°C)*			
					gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Cool-ing med	Air wet bulb	Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power—Two Hours 9th (2 HI LO) Gear											
266.16 *(198.47)*	15515 *(69.01)*	6.43 *(10.35)*	2599	3.77	20.074 *(75.989)*	0.528 *(0.321)*	13.26 *(2.612)*	173 *(78.3)*	57 *(13.6)*	60 *(20.3)*	28.830 *(97.350)*
75% of Pull at Maximum Power—Ten Hours 5th Gear											
216.83 *(161.69)*	12045 *(53.58)*	6.75 *(10.86)*	2697	2.67	18.349 *(69.459)*	0.592 *(0.360)*	11.82 *(2.328)*	172 *(77.9)*	54 *(11.9)*	67 *(19.4)*	29.057 *(98.120)*
50% of Pull at Maximum Power—Two Hours 5th Gear											
148.88 *(111.02)*	8054 *(35.83)*	6.93 *(11.16)*	2741	1.58	15.091 *(57.127)*	0.709 *(0.432)*	9.87 *(1.943)*	171 *(76.9)*	59 *(15.0)*	72 *(21.9)*	28.785 *(97.200)*
50% of Pull at Reduced Engine Speed—Two Hours 13th (3 LO LO) Gear											
149.34 *(111.36)*	8062 *(35.86)*	6.95 *(11.18)*	1647	1.62	10.394 *(39.347)*	0.487 *(0.296)*	14.37 *(2.830)*	172 *(77.8)*	61 *(16.1)*	75 *(23.9)*	28.710 *(96.950)*
MAXIMUM POWER IN SELECTED GEARS											
233.53 *(174.14)*	30090 *(133.85)*	2.91 *(4.58)*	2650	14.78	4th (1 LO HI) Gear			170 *(76.7)*	54 *(12.2)*	63 *(17.2)*	28.860 *(97.460)*
259.76 *(193.70)*	27689 *(123.17)*	3.52 *(5.66)*	2600	11.01	5th (1 HI INT) Gear			172 *(77.8)*	53 *(11.7)*	67 *(19.4)*	29.090 *(98.230)*
264.94 *(197.57)*	24179 *(107.55)*	4.11 *(6.61)*	2597	7.77	6th (1 HI HI) Gear			173 *(78.3)*	52 *(11.1)*	66 *(18.9)*	29.100 *(98.270)*
269.53 *(200.99)*	21361 *(95.02)*	4.73 *(7.61)*	2599	5.99	7th (2 LO LO) Gear			173 *(78.1)*	52 *(11.1)*	66 *(18.9)*	29.100 *(98.270)*
274.65 *(204.81)*	17863 *(79.46)*	5.77 *(9.28)*	2600	4.44	8th (2 LO INT) Gear			173 *(78.3)*	52 *(11.1)*	65 *(18.3)*	29.110 *(98.300)*
274.88 *(204.98)*	16047 *(71.38)*	6.42 *(10.34)*	2597	3.89	9th (2 HI LO) Gear			172 *(77.8)*	52 *(11.1)*	64 *(17.8)*	29.130 *(98.370)*
278.78 *(207.89)*	16004 *(71.19)*	6.53 *(10.51)*	2599	3.81	10th (2 LO HI) Gear			173 *(78.1)*	52 *(11.1)*	65 *(18.3)*	29.120 *(98.330)*
275.15 *(205.18)*	13271 *(59.03)*	7.78 *(12.51)*	2599	3.09	11th (2 HI INT) Gear			173 *(78.3)*	53 *(11.7)*	67 *(19.4)*	29.090 *(98.230)*
273.81 *(204.18)*	11676 *(51.94)*	8.79 *(14.15)*	2600	2.61	12th (2 HI HI) Gear			173 *(78.1)*	53 *(11.7)*	67 *(19.4)*	29.090 *(98.230)*

Department of Agricultural Engineering

Dates of Test: May 12-26, 1981

Manufacturer: MASSEY FERGUSON, INC., 1901 Bell Avenue, Des Moines, Iowa 50315

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 46.3 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60°** *(15°/15°)* 0.8406 **Fuel weight** 6.999 lbs/gal *(0.839 kg/l)* **Oil SAE** 15W-40 **API service classification** SB/SE-CA/CD **To motor** 7.753 gal *(29.348 l)* **Drained from motor** 6.976 gal *(26.407 l)* **Transmission and final drive lubricant** M. F. Permatran fluid **Total time engine was operated** 44.0 hours

ENGINE: Make Cummins Diesel **Type** eight cylinder vee with turbocharger **Serial No.** 10966576 **Crankshaft** lengthwise **Rated rpm** 2600 **Bore and stroke** 5.5" × 4.75" *(139.7 mm × 120.7 mm)* **Compression ratio** 15.5 to 1 **Displacement** 903 cu in *(14800 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements with aspirator **Oil filter** one full flow cartridge and one bypass cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** two paper cartridges **Muffler** vertical **Cooling medium temperature control** two thermostats.

CHASSIS: Type four wheel with duals **Serial No.** 9D002815 **Tread width** rear 70" *(1778 mm)* to 130.5" *(3315 mm)* front 70" *(1778 mm)* to 130.5" *(3315 mm)* **Wheel base** 137" *(3480 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 83.1" *(2111 mm)* Vertical distance above roadway 49.2" *(1250 mm)* Horizontal distance from center of rear wheel tread 0.2" *(4 mm)* to the left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial (3) range operator controlled powershift **Advertised speeds mph *(km/h)*** first 2.4 *(3.8)* second 2.9 *(4.6)* third 3.2 *(5.1)* fourth 3.2 *(5.2)* fifth 3.8 *(6.1)* sixth 4.3 *(6.9)* seventh 4.8 *(7.8)* eighth 5.8 *(9.3)* ninth 6.4 *(10.3)* tenth 6.5 *(10.5)* eleventh 7.7 *(12.4)* twelfth 8.7 *(14.0)* thirteenth 10.7 *(17.2)* fourteenth 12.8 *(20.6)* fifteenth 14.2 *(22.9)* sixteenth 14.4 *(23.2)* seventeenth 17.0 *(27.4)* eighteenth 19.2 *(30.9)* reverse 3.2 *(5.2)*, 3.9 *(6.3)*, 4.3 *(7.0)*, 4.4 *(7.1)*, 5.2 *(8.3)*, 5.8 *(9.4)*, **Clutch** multiple wet disc operated by foot pedal **Brakes** caliper disc hydraulically operated by foot pedal or mechanically by hand lever **Steering** hydrostatic and articulated **Turning radius** (on concrete surface without brake) right 246" *(6.25 m)* left 246" *(6.25 m)* **Turning space diameter** (on concrete surface without brake) right 516" *(13.10 m)* left 516" *(13.10 m)* **Power take-off** 1000 rpm at 2347 engine rpm.

LUGGING ABILITY IN 9th (2 HI LO) GEAR

Crankshaft Speed rpm	2597	2338	2084	1822	1560	1297
Pull—lbs *(kN)*	16047 *(71.38)*	18163 *(80.79)*	19448 *(86.51)*	19814 *(88.13)*	19499 *(86.74)*	18933 *(84.22)*
Increase in Pull %	0	13	21	23	22	18
Power—Hp *(kW)*	274.88 *(204.98)*	278.07 *(207.36)*	263.68 *(196.62)*	234.43 *(174.81)*	197.84 *(147.53)*	160.05 *(119.35)*
Speed—Mph *(km/h)*	6.42 *(10.34)*	5.74 *(9.24)*	5.08 *(8.18)*	4.44 *(7.14)*	3.80 *(6.12)*	3.17 *(5.10)*
Slip %	3.89	4.60	5.22	5.38	5.22	5.07

TRACTOR SOUND LEVEL WITH CAB	dB(A)
Maximum Available Power- -Two Hours	83.5
75% of Pull at Maximum Power—Ten Hours	83.0
50% of Pull at Maximum Power—Two Hours	83.0
50% of Pull at Reduced Engine Speed—Two Hours	78.5
Bystander in 17th (3 HI INT) gear	93.5

TIRES, BALLAST AND WEIGHT		**With Ballast**	**Without Ballast**
Rear Tires	—No., size, ply & psi *(kPa)*	Four 23.1-34; 8; inner 16 *(110)* outer 12 *(85)*	Four 23.1-34; 8; inner 16 *(110)* outer 12 *(85)*
Ballast	—Liquid (each inner)	1330 lb *(603 kg)*	None
	—Cast Iron (each)	None	None
Front Tires	—No., size, ply & psi *(kPa)*	Four 23.1-34, 8; inner 16 *(110)* outer 12 *(85)*	Four 23.1-34; 8; inner 16 *(110)* outer 12 *(85)*
Ballast	—Liquid (each inner)	158 lb *(72 kg)*	None
	—Cast Iron (each)	None	None
Height of Drawbar		22 in *(560 mm)*	22 in *(560 mm)*
Static Weight with Operator	—Rear	14840 lb *(6731 kg)*	12180 lb *(5525 kg)*
	Front	19100 lb *(8664 kg)*	18785 lb *(8521 kg)*
	Total	33940 lb *(15395 kg)*	30965 lb *(14046 kg)*

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump was 148°F *(64.3°C)*. Five gears were chosen between 15% slip and 10 mph *(16.1 km/h)*.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1391.**

LOUIS I. LEVITICUS
Engineer-in Charge

K. VON BARGEN
W. E. SPLINTER
L. L. BASHFORD
Board of Tractor Test Engineers

Massey Ferguson MF 4900 Diesel

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Roy G. Arnold, Director

NEBRASKA TRACTOR TEST 1392 — MASSEY FERGUSON MF 184-4 DIESEL 12 SPEED

POWER TAKE-OFF PERFORMANCE

Power Hp (kW)	Crank shaft speed rpm	Fuel Consumption gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temperature °F (°C) Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg (kPa)
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—611 rpm)								
62.45 (46.57)	2200	4.067 (15.395)	0.456 (0.278)	15.35 (3.025)	201 (93.7)	60 (15.6)	75 (23.9)	28.900 (97.591)
Standard Power take-off Speed (540 rpm)—One Hour								
59.56 (44.41)	1943	3.629 (13.737)	0.427 (0.260)	16.41 (3.233)	203 (94.8)	61 (15.9)	76 (24.4)	28.900 (97.591)
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
54.71 (40.80)	2266	3.626 (13.726)	0.465 (0.283)	15.09 (2.972)	190 (87.5)	60 (15.6)	74 (23.3)	....
0.00 (0.00)	2362	1.567 (5.932)	....	....	151 (66.1)	60 (15.6)	75 (23.6)	....
28.04 (20.91)	2324	2.286 (8.653)	0.571 (0.348)	12.26 (2.417)	166 (74.4)	60 (15.6)	75 (23.6)	....
62.86 (46.87)	2200	4.097 (15.509)	0.457 (0.278)	15.34 (3.022)	197 (91.7)	61 (15.8)	76 (24.2)	....
14.28 (10.65)	2368	1.858 (7.033)	0.912 (0.555)	7.68 (1.514)	160 (70.8)	60 (15.6)	75 (23.9)	....
41.56 (30.99)	2295	2.856 (10.811)	0.482 (0.293)	14.55 (2.867)	175 (79.4)	61 (16.1)	75 (23.9)	....
Av 33.58 **Av (25.04)**	**2302**	**2.715** **(10.277)**	**0.567** **(0.345)**	**12.37** **(2.437)**	**173** **(78.3)**	**60** **(15.7)**	**75** **(23.8)**	**28.913** **(97.636)**

DRAWBAR PERFORMANCE (Front Wheel Drive Disengaged)

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temp. °F (°C) Cool-ing med	Air wet bulb	Air dry bulb	Barom. inch Hg (kPa)
Maximum Available Power—Two Hours 9th Gear											
50.41 (37.59)	3356 (14.93)	5.63 (9.06)	2200	7.07	3.996 (15.127)	0.555 (0.338)	12.61 (2.485)	191 (88.1)	53 (11.4)	70 (20.8)	28.920 (97.660)
75% of Pull at Maximum Power—Ten Hours 9th Gear											
41.25 (30.76)	2589 (11.51)	5.98 (9.62)	2284	5.05	3.407 (12.898)	0.579 (0.352)	12.11 (2.385)	181 (82.9)	56 (13.1)	69 (20.6)	28.814 (97.301)
50% of Pull at Maximum Power—Two Hours 9th Gear											
28.41 (21.19)	1726 (7.68)	6.17 (9.93)	2323	3.55	2.658 (10.062)	0.655 (0.399)	10.69 (2.106)	160 (71.1)	56 (13.3)	62 (16.4)	28.755 (97.100)
50% of Pull at Reduced Engine Speed—Two Hours 11th Gear											
28.60 (21.33)	1731 (7.70)	6.19 (9.97)	1475	3.22	2.052 (7.766)	0.503 (0.306)	13.94 (2.747)	169 (76.1)	56 (13.3)	66 (18.6)	28.770 (97.150)
MAXIMUM POWER IN SELECTED GEARS											
49.08 (36.60)	5500 (24.47)	3.35 (5.38)	2232	14.94	7th Gear			171 (76.9)	43 (6.1)	47 (8.3)	29.090 (98.230)
52.20 (38.93)	4434 (19.72)	4.42 (7.11)	2199	9.66	8th Gear			182 (83.3)	52 (11.1)	64 (17.8)	28.930 (97.690)
51.85 (38.66)	3447 (15.33)	5.64 (9.08)	2201	6.98	9th Gear			180 (82.2)	50 (10.0)	59 (15.0)	28.910 (97.620)
52.38 (39.06)	2756 (12.26)	7.13 (11.47)	2200	5.55	10th Gear			182 (83.3)	52 (11.1)	65 (18.3)	28.930 (97.690)
51.37 (38.30)	2102 (9.35)	9.16 (14.75)	2201	4.14	11th Gear			182 (83.3)	52 (11.1)	67 (19.4)	28.920 (97.660)

LUGGING ABILITY IN 9th GEAR

Crankshaft Speed rpm	2201	1980	1763	1544	1314	1098	874
Pull—lbs (kN)	3447 (15.33)	3735 (16.62)	3957 (17.60)	4198 (18.67)	4261 (18.95)	4407 (19.60)	4246 (18.89)
Increase in Pull %	0	8	15	22	24	28	23
Power—Hp (kW)	51.85 (38.66)	50.17 (37.41)	47.06 (35.09)	43.46 (32.41)	37.41 (27.89)	32.18 (24.00)	24.78 (18.48)
Speed—Mph (km/h)	5.64 (9.08)	5.04 (8.11)	4.46 (7.18)	3.88 (6.25)	3.29 (5.30)	2.74 (4.41)	2.19 (3.52)
Slip %	6.98	7.71	8.07	8.78	9.02	9.49	9.14

Department of Agricultural Engineering

Dates of Test: May 11-20, 1981

Manufacturer: MASSEY FERGUSON S.P.A.
LANDINI DIVISION Via Matteotti 17, 42042
Fabrico (RE) Italy

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 46.3 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60°** *(15°/15°)* 0.8416 **Fuel weight** 7.007 lbs/gal *(0.840 kg/l)* **Oil SAE** 20-20W **API service classification** CC/SE **To motor** 1.725 gal *(6.530 l)* **Drained from motor** 1.381 gal *(5.228 l)* **Transmission and final drive lubricant** M. F. Permatran fluid **Total time engine was operated** 44.5 hours

ENGINE: Make Perkins Diesel **Type** four cylinder vertical **Serial No.** LD22574U657285G **Crankshaft** lengthwise **Rated rpm** 2200 **Bore and stroke** 3.875" × 5.0" *(98.4 mm × 127.0 mm)* **Compression ratio** 16 to 1 **Displacement** 236 cu in *(3865 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** oil bath with centrifugal precleaner **Oil filter** one full flow paper cartridge **Fuel filter** one paper element **Muffler** vertical **Cooling medium temperature control** one thermostat.

CHASSIS: Type front wheel assist **Serial No.** 2204365 **Tread width** rear 59.1" *(1500 mm)* to 78.7" *(2000 mm)* front 60.0" *(1525 mm)* **Wheel base** 87.0" *(2210 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 34.1" *(866 mm)* Vertical distance above roadway 29.2" *(742 mm)* Horizontal distance from center of rear wheel tread 0" *(0 mm)* to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph** ***(km/h)*** first 0.8 *(1.3)* second 1.3 *(2.0)* third 1.6 *(2.6)* fourth 2.0 *(3.2)* fifth 2.5 *(4.0)* sixth 3.1 *(5.0)* seventh 3.9 *(6.3)* eighth 4.9 *(7.9)* ninth 6.1 *(9.8)* tenth 7.6 *(12.2)* eleventh 9.6 *(15.5)* twelfth 15.0 *(24.2)* reverse 2.1 *(3.4)*, 3.3 *(5.3)*, 4.2 *(6.7)*, 6.5 *(10.5)* **Clutch** dry disc operated by foot pedal **Brakes** dry disc operated by two foot pedals which can be locked together and hand lever **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 180.5" *(4.58 m)* left 180.5" *(4.58 m)* (on concrete surface without brake) right 196.5" *(4.99 m)* left 196.5" *(4.99 m)* **Turning space diameter** (on concrete surface with brake applied) right 372" *(9.45 m)* left 372" *(9.45 m)* (on concrete surface without brake) right 405" *(10.29 m)* left 405" *(10.29 m)* **Power take-off** 540 rpm at 1943 engine rpm.

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump was

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)	Front Wheel Drive Disengaged dB (A)
Maximum Available Power—Two Hours	100.5	100.5
75% of Pull at Maximum Power—Ten Hours		98.5
50% of Pull at Maximum Power—Two Hours		97.0
50% of Pull at Reduced Engine Speed—Two Hours		93.5
Bystander in 12th gear		87.0

DRAWBAR PERFORMANCE (Front Wheel Drive Engaged)

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temp. °F *(°C)* Cool-ing med	Air wet bulb	Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power—Two Hours 9th Gear											
51.04 *(38.06)*	3285 *(14.61)*	5.83 *(9.38)*	2200	5.03	4.014 *(15.194)*	0.551 *(0.335)*	12.72 *(2.505)*	195 *(90.3)*	54 *(11.9)*	71 *(21.4)*	28.900 *(97.590)*
MAXIMUM POWER IN SELECTED GEARS											
41.89 *(31.24)*	7106 *(31.61)*	2.21 *(3.56)*	2276	14.94	5th Gear			165 *(73.6)*	53 *(11.7)*	57 *(13.9)*	28.760 *(97.120)*
53.50 *(39.90)*	4352 *(19.36)*	4.61 *(7.42)*	2198	6.74	8th Gear			182 *(83.3)*	51 *(10.6)*	63 *(17.2)*	28.930 *(97.690)*
52.59 *(39.22)*	3383 *(15.05)*	5.83 *(9.38)*	2201	5.03	9th Gear			183 *(83.9)*	51 *(10.6)*	61 *(16.1)*	28.920 *(97.660)*

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi *(kPa)*	Two 16.9-30; 6; 18 *(125)*	Two 16.9-30: 6; 18 *(125)*
Ballast	—Liquid (each)	480 lb *(218 kg)*	None
	—Cast Iron (each)	None	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 11.2-24; 6; 18 *(125)*	Two 11.2-24; 6; 18 *(125)*
Ballast	—Liquid (each)	218 lb *(99 kg)*	None
	—Cast Iron (each)	None	None
Height of Drawbar		20 in *(510 mm)*	20 in *(510 mm)*
Static Weight with Operator	—Rear	4840 lb *(2196 kg)*	3880 lb *(1760 kg)*
	Front	2935 lb *(1331 kg)*	2500 lb *(1134 kg)*
	Total	7775 lb *(3527 kg)*	6380 lb *(2894 kg)*

166°F *(74.3°C)*. Five gears were chosen between 15% slip and 10 mph *(16.1 km/h)*.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1392.**

LOUIS I. LEVITICUS
Engineer-in Charge

K. VON BARGEN
W. E. SPLINTER
L. L. BASHFORD
Board of Tractor Test Engineers

Massey Ferguson MF 184-4 Diesel

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Roy G. Arnold, Director

NEBRASKA TRACTOR TEST 1393 — JOHN DEERE 2040 DIESEL
8 SPEED TSS TRANSMISSION
(WITH MECHANICAL FRONT WHEEL DRIVE)

POWER TAKE-OFF PERFORMANCE

	Power Hp *(kW)*	Crank shaft speed rpm	Fuel Consumption			Temperature °F *(°C)*			
			gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg *(kPa)*
MAXIMUM POWER AND FUEL CONSUMPTION									
Rated Engine Speed—Two Hours (PTO Speed—567 rpm)									
	40.44	2500	2.774	0.481	14.58	184	67	75	28.810
	(30.16)		*(10.501)*	*(0.293)*	*(2.872)*	*(84.6)*	*(19.6)*	*(23.8)*	*(97.287)*
Standard Power take-off Speed (540 rpm)—One Hour									
	40.22	2382	2.705	0.471	14.87	185	67	75	28.810
	(29.99)		*(10.240)*	*(0.287)*	*(2.929)*	*(85.0)*	*(19.4)*	*(23.7)*	*(97.287)*
VARYING POWER AND FUEL CONSUMPTION—Two Hours									
	35.35	2568	2.547	0.505	13.88	182	67	75	......
	(26.36)		*(9.641)*	*(0.307)*	*(2.734)*	*(83.1)*	*(19.4)*	*(23.6)*	......
	0.00	2662	1.156	.....	.....	173	67	74	......
	(0.00)		*(4.376)*	.....	.....	*(78.3)*	*(19.4)*	*(23.3)*	......
	18.01	2623	1.777	0.691	10.14	176	68	75	......
	(13.43)		*(6.727)*	*(0.420)*	*(1.996)*	*(80.0)*	*(19.7)*	*(23.9)*	......
	40.37	2499	2.791	0.485	14.46	184	68	75	......
	(30.10)		*(10.565)*	*(0.295)*	*(2.849)*	*(84.2)*	*(19.7)*	*(23.9)*	......
	9.08	2640	1.447	1.117	6.27	175	68	75	......
	(6.77)		*(5.477)*	*(0.680)*	*(1.236)*	*(79.2)*	*(20.0)*	*(23.9)*	......
	26.71	2592	2.128	0.558	12.55	179	68	76	......
	(19.92)		*(8.055)*	*(0.340)*	*(2.473)*	*(81.7)*	*(19.7)*	*(24.2)*	......
Av	**21.59**	**2597**	**1.974**	**0.641**	**10.93**	**178**	**67**	**75**	**28.810**
Av	*(16.10)*		*(7.472)*	*(0.390)*	*(2.155)*	*(81.1)*	*(19.7)*	*(23.8)*	*(97.287)*

DRAWBAR PERFORMANCE
(Front Wheel Drive Engaged)

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption			Temp. °F *(°C)*			
					gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Cool-ing med	Air wet bulb	Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power—Two Hours 4th Gear											
31.90	2325	5.14	2501	4.20	2.729	0.600	11.69	187	63	80	28.835
(23.79)	*(10.34)*	*(8.28)*			*(10.330)*	*(0.365)*	*(2.303)*	*(85.8)*	*(16.9)*	*(26.4)*	*(97.371)*
75% of Pull at Maximum Power—Ten Hours 4th Gear											
25.67	1812	5.31	2551	2.94	2.397	0.654	10.71	186	70	85	28.797
(19.14)	*(8.06)*	*(8.55)*			*(9.075)*	*(0.398)*	*(2.109)*	*(85.6)*	*(21.1)*	*(29.4)*	*(97.243)*
50% of Pull at Maximum Power—Two Hours 4th Gear											
17.50	1212	5.42	2581	2.22	1.998	0.800	8.76	181	66	79	28.825
(13.05)	*(5.39)*	*(8.72)*			*(7.562)*	*(0.487)*	*(1.726)*	*(82.5)*	*(18.9)*	*(25.8)*	*(97.340)*
50% of Pull at Reduced Engine Speed—Two Hours 6th Gear											
17.68	1221	5.43	1460	2.05	1.409	0.558	12.55	183	67	83	28.785
(13.19)	*(5.43)*	*(8.74)*			*(5.334)*	*(0.340)*	*(2.472)*	*(83.6)*	*(19.4)*	*(28.3)*	*(97.203)*
MAXIMUM POWER IN SELECTED GEARS											
25.70	5541	1.74	2550	14.94	1st Gear			177	57	64	28.820
(19.16)	*(24.65)*	*(2.80)*						*(80.3)*	*(13.9)*	*(17.8)*	*(97.321)*
31.78	4818	2.47	2499	10.68	2nd Gear			185	64	75	28.850
(23.70)	*(21.43)*	*(3.98)*						*(85.0)*	*(17.8)*	*(23.9)*	*(97.422)*
32.95	3301	3.74	2499	6.03	3rd Gear			185	64	74	28.850
(24.57)	*(14.68)*	*(6.02)*						*(84.7)*	*(17.8)*	*(23.3)*	*(97.422)*
33.21	2415	5.16	2500	3.97	4th Gear			184	64	72	28.850
(24.76)	*(10.74)*	*(8.30)*						*(84.4)*	*(17.8)*	*(22.2)*	*(97.420)*
32.80	1847	6.66	2500	3.14	5th Gear			186	65	76	28.850
(24.46)	*(8.22)*	*(10.72)*						*(85.6)*	*(18.3)*	*(24.4)*	*(97.420)*
31.15	1256	9.30	2500	2.02	6th Gear			185	65	77	28.840
(23.23)	*(5.58)*	*(14.97)*						*(85.0)*	*(18.3)*	*(25.0)*	*(97.390)*

Department of Agricultural Engineering

Dates of Test: May 26 to June 6, 1981

Manufacturer: JOHN DEERE WERKE
MANNHEIM, Mannheim, West Germany

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 46.3 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60°** *(15°/15°)* 0.8417 **Fuel weight** 7.008 lbs/gal *(0.840 kg/l)* **Oil SAE** 30 **API service classification** CD/SD **To motor** 1.920 gal *(7.268 l)* **Drained from motor** 1.855 gal *(7.022 l)* **Transmission and final drive lubricant** John Deere Hy Gard Fluid **Front axle lubricant** EP SAE 90 transmission oil **Total time engine was operated** 38.5 hours.

ENGINE: Make John Deere Diesel **Type** three cylinder vertical **Serial No.** 3179DL06 482980CD **Crankshaft** lengthwise **Rated rpm** 2500 **Bore and stroke** 4.19" × 4.33" *(106.5 mm × 110 mm)* **Compression ratio** 16.8 to 1 **Displacement** 179 cu in *(2934 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil **Fuel filter** one paper element and one mesh strainer **Muffler** vertical **Cooling medium temperature control** one thermostat.

CHASSIS: Type front wheel assist **Serial No.** 2040-400244L **Tread width** rear 53.5" *(1360 mm)* to 73.2" *(1860 mm)* front 53" *(1350 mm)* to 77" *(1950 mm)* **Wheel base** 81" *(2060 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 33.3" *(845 mm)* Vertical distance above roadway 29.8" *(757 mm)* Horizontal distance from center of rear wheel tread 0" *(0 mm)* to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph *(km/h)*** first 1.9 *(3.1)* second 2.6 *(4.2)* third 3.8 *(6.1)* fourth 5.1 *(8.2)* fifth 6.5 *(10.5)* sixth 9.0 *(14.5)* seventh 13.0 *(20.9)* eighth 17.5 *(28.2)* reverse 2.9 *(4.7)*, 4.0 *(6.5)*, 5.8 *(9.4)*, 7.8 *(12.6)* **Clutch** single dry disc operated by foot pedal **Brakes** wet disc hydraulically operated by two foot pedals which can be locked together **Steering** power assist **Turning radius** (on concrete surface with brake applied) right 142" *(3.60 m)* left 142" *(3.60 m)* (on concrete surface without brake) right 177" *(4.50 m)* left 177" *(4.50 m)* **Turning space diameter** (on concrete surface with brake applied) right 308" *(7.82 m)* left 308" *(7.82 m)* (on concrete surface without brake) right 378" *(9.60 m)* left 378" *(9.60 m)* **Power take-off** 540 rpm at 2382 engine rpm.

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

LUGGING ABILITY IN 4th GEAR

Crankshaft Speed rpm	2500	2254	1999	1749	1500	1255
Pull—lbs *(kN)*	2415 *(10.74)*	2624 *(11.67)*	2753 *(12.25)*	2818 *(12.53)*	2861 *(12.73)*	2817 *(12.53)*
Increase in Pull %	0	9	14	17	18	17
Power—Hp *(kW)*	33.21 *(24.76)*	32.38 *(24.15)*	30.02 *(22.38)*	26.83 *(20.01)*	23.35 *(17.41)*	19.23 *(14.34)*
Speed—Mph *(km/h)*	5.16 *(8.30)*	4.63 *(7.45)*	4.09 *(6.58)*	3.57 *(5.75)*	3.06 *(4.93)*	2.56 *(4.12)*
Slip %	3.97	4.29	4.67	4.80	5.05	4.92

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)	Front Wheel Drive Engaged dB (A)
Maximum Available Power—Two Hours	95.0	95.0
75% of Pull at Maximum Power—Ten Hours		94.0
50% of Pull at Maximum Power—Two Hours		95.0
50% of Pull at Reduced Engine Speed—Two Hours		88.5
Bystander in 7th gear	85.5	

DRAWBAR PERFORMANCE
(Front Wheel Drive Disengaged)

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr *(l/h)*	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Fuel Consumption Hp.hr/gal *(kW.h/l)*	Temp. °F (°C) Cooling med	Temp. °F (°C) Air wet bulb	Temp. °F (°C) Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power—Two Hours 4th Gear											
31.11 *(23.20)*	2304 *(10.25)*	5.06 *(8.15)*	2500	5.69	2.676 *(10.128)*	0.603 *(0.367)*	11.63 *(2.290)*	189 *(87.2)*	64 *(17.5)*	85 *(29.2)*	28.820 *(97.321)*
MAXIMUM POWER IN SELECTED GEARS											
27.36 *(20.40)*	4282 *(19.05)*	2.40 *(3.86)*	2538	14.84	2nd Gear			180 *(82.2)*	60 *(15.6)*	71 *(21.7)*	28.840 *(97.388)*
32.35 *(24.13)*	2387 *(10.62)*	5.08 *(8.18)*	2503	5.54	4th Gear			184 *(84.4)*	64 *(17.8)*	73 *(22.8)*	28.850 *(97.420)*

TIRES, BALLAST AND WEIGHT		**With Ballast**	**Without Ballast**
Rear Tires	—No., size, ply & psi *(kPa)*	Two 16.9-28; 6; 16 *(110)*	Two 16.9-28; 6; 16 *(110)*
Ballast	—Liquid (each)	None	None
	—Test Equip. (each)	85 lb *(38 kg)*	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 9.5-24; 6; 16 *(110)*	Two 9.5-24; 6; 16 *(110)*
Ballast	—Liquid (each)	None	None
	—Test Equip. (each)	48 lb *(22 kg)*	None
Height of Drawbar		16.5 in *(420 mm)*	16.5 in *(420 mm)*
Static Weight with Operator—Rear		3645 lb *(1653 kg)*	3475 lb *(1576 kg)*
Front		2395 lb *(1086 kg)*	2300 lb *(1043 kg)*
Total		6040 lb *(2739 kg)*	5775 lb *(2619 kg)*

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump was 148°F *(64.4°C)*. Six gears were chosen between 15% slip and 10 mph *(16.1 km/h)*.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1393.**

LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
W. E. SPLINTER
L. L. BASHFORD
Board of Tractor Test Engineers

2040
JOHN DEERE

John Deere 2040 Diesel

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Roy G. Arnold, Director

NEBRASKA TRACTOR TEST 1394 — JOHN DEERE 2240 DIESEL
8 SPEED TSS TRANSMISSION
(WITH MECHANICAL FRONT WHEEL DRIVE)

POWER TAKE-OFF PERFORMANCE

	Power Hp *(kW)*	Crank shaft speed rpm	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temperature °F *(°C)* Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg *(kPa)*
MAXIMUM POWER AND FUEL CONSUMPTION									
Rated Engine Speed—Two Hours (PTO Speed—567 rpm)									
	50.90 *(37.96)*	2500	3.404 *(12.886)*	0.469 *(0.285)*	14.96 *(2.946)*	190 *(87.9)*	64 *(17.9)*	76 *(24.3)*	28.863 *(97.467)*
Standard Power take-off Speed (540 rpm)—One Hour									
	49.20 *(36.69)*	2383	3.211 *(12.155)*	0.457 *(0.278)*	15.32 *(3.019)*	191 *(88.3)*	65 *(18.3)*	77 *(24.9)*	28.855 *(97.439)*
VARYING POWER AND FUEL CONSUMPTION—Two Hours									
	45.07 *(33.61)*	2604	3.095 *(11.716)*	0.481 *(0.293)*	14.56 *(2.869)*	186 *(85.6)*	65 *(18.3)*	77 *(25.0)*	....
	0.00 *(0.00)*	2651	1.336 *(5.057)*	....	....	173 *(78.3)*	65 *(18.3)*	78 *(25.3)*	....
	22.67 *(16.91)*	2622	2.025 *(7.665)*	0.626 *(0.381)*	11.20 *(2.206)*	177 *(80.3)*	66 *(18.6)*	78 *(25.3)*	....
	51.24 *(38.21)*	2499	3.408 *(12.901)*	0.466 *(0.284)*	15.04 *(2.962)*	191 *(88.1)*	66 *(18.6)*	78 *(25.3)*	....
	11.42 *(8.52)*	2640	1.618 *(6.125)*	0.993 *(0.604)*	7.06 *(1.391)*	175 *(79.2)*	66 *(18.9)*	78 *(25.6)*	....
	33.71 *(25.14)*	2596	2.487 *(9.414)*	0.517 *(0.315)*	13.55 *(2.670)*	181 *(82.5)*	67 *(19.2)*	80 *(26.4)*	....
Av **Av**	**27.35** ***(20.39)***	**2602**	**2.328** ***(8.812)***	**0.597** ***(0.363)***	**11.75** ***(2.314)***	**180** ***(82.3)***	**66** ***(18.7)***	**78** ***(25.4)***	**28.845** ***(97.397)***

DRAWBAR PERFORMANCE
(Front Wheel Drive Engaged)

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temp. °F *(°C)* Cool-ing med	Air wet bulb	Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power—Two Hours 4th Gear											
40.16 *(29.95)*	2958 *(13.16)*	5.09 *(8.19)*	2502	4.88	3.353 *(12.694)*	0.585 *(0.356)*	11.98 *(2.360)*	194 *(90.0)*	66 *(18.9)*	78 *(25.6)*	28.750 *(97.080)*
75% of Pull at Maximum Power—Ten Hours 4th Gear											
33.46 *(24.95)*	2334 *(10.38)*	5.38 *(8.65)*	2604	3.53	2.922 *(11.060)*	0.612 *(0.372)*	11.45 *(2.256)*	186 *(85.4)*	67 *(19.4)*	75 *(23.8)*	28.715 *(96.966)*
50% of Pull at Maximum Power—Two Hours 4th Gear											
22.67 *(16.91)*	1547 *(6.88)*	5.50 *(8.85)*	2628	2.31	2.319 *(8.778)*	0.717 *(0.436)*	9.78 *(1.926)*	184 *(84.4)*	70 *(20.8)*	83 *(28.3)*	28.710 *(96.950)*
50% of Pull at Reduced Engine Speed—Two Hours 6th Gear											
22.76 *(16.97)*	1552 *(6.90)*	5.50 *(8.85)*	1491	2.51	1.766 *(6.684)*	0.544 *(0.331)*	12.89 *(2.539)*	182 *(83.1)*	64 *(17.8)*	77 *(24.7)*	28.805 *(97.270)*
MAXIMUM POWER IN SELECTED GEARS											
36.92 *(27.53)*	5777 *(25.70)*	2.40 *(3.86)*	2550	14.92	2nd Gear			182 *(83.3)*	59 *(15.0)*	64 *(17.8)*	28.840 *(97.390)*
41.22 *(30.73)*	4208 *(18.72)*	3.67 *(5.91)*	2500	7.43	3rd Gear			191 *(88.1)*	58 *(14.4)*	67 *(19.4)*	28.780 *(97.190)*
42.13 *(31.42)*	3107 *(13.82)*	5.08 *(8.18)*	2500	4.94	4th Gear			190 *(87.5)*	56 *(13.3)*	65 *(18.3)*	28.790 *(97.220)*
41.74 *(31.13)*	2373 *(10.56)*	6.60 *(10.61)*	2500	3.68	5th Gear			189 *(87.2)*	59 *(15.0)*	68 *(20.0)*	28.780 *(97.190)*
39.89 *(29.75)*	1620 *(7.20)*	9.24 *(14.86)*	2500	2.31	6th Gear			189 *(87.2)*	61 *(16.1)*	72 *(22.2)*	28.780 *(97.190)*

LUGGING ABILITY IN 4th GEAR

Crankshaft Speed rpm	2500	2247	1996	1741	1501	1254
Pull—lbs *(kN)*	3107 *(13.82)*	3319 *(14.76)*	3477 *(15.47)*	3623 *(16.12)*	3727 *(16.58)*	3600 *(16.01)*
Increase in Pull %	0	7	12	17	20	16
Power—Hp *(kW)*	42.13 *(31.42)*	40.20 *(29.97)*	37.29 *(27.80)*	33.78 *(25.19)*	29.86 *(22.27)*	24.17 *(18.02)*
Speed—Mph *(km/h)*	5.08 *(8.18)*	4.54 *(7.31)*	4.02 *(6.47)*	3.50 *(5.63)*	3.00 *(4.83)*	2.52 *(4.05)*
Slip %	4.94	5.56	5.80	6.05	6.53	6.05

Department of Agricultural Engineering

Dates of Test: May 26 to June 4, 1981

Manufacturer: JOHN DEERE WERKE MANNHEIM, Mannheim, West Germany

FUEL, OIL AND TIME: **Fuel** No. 2 Diesel **Cetane No.** 46.3 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60°** *(15°/15°)* 0.8417 **Fuel weight** 7.008 lbs/gal *(0.840 kg/l)* **Oil SAE 30** **API service classification** CD/SD **To motor** 1.927 gal *(7.294 l)* **Drained from motor** 1.557 gal *(5.894 l)* **Transmission and final drive lubricant** John Deere Hy Gard Fluid **Front axle lubricant** EP SAE 90 transmission oil **Total time engine was operated** 40.0 hours.

ENGINE: **Make** John Deere Diesel **Type** three cylinder vertical **Serial No.** 3179DL01 480974CD **Crankshaft** lengthwise **Rated rpm** 2500 **Bore and stroke** 4.19" × 4.33" *(106.5 mm × 110 mm)* **Compression ratio** 16.8 to 1 **Displacement** 179 cu in *(2934 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil **Fuel filter** one paper element and one mesh strainer **Muffler** vertical **Cooling medium temperature control** one thermostat.

CHASSIS: **Type** front wheel assist **Serial No.** 2240-400231L **Tread width** rear 55.1" *(1400 mm)* to 78.7" *(2000 mm)* front 53" *(1350 mm)* to 77" *(1950 mm)* **Wheel base** 81" *(2060 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 32.6" *(827 mm)* Vertical distance above roadway 29.8" *(757 mm)* Horizontal distance from center of rear wheel tread 0" *(0 mm)* to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph *(km/h)*** first 1.9 *(3.1)* second 2.6 *(4.2)* third 3.8 *(6.1)* fourth 5.1 *(8.2)* fifth 6.5 *(10.5)* sixth 9.0 *(14.5)* seventh 13.0 *(20.9)* eighth 17.5 *(28.2)* reverse 2.9 *(4.7)*, 4.0 *(6.5)*, 5.8 *(9.4)*, 7.8 *(12.6)* **Clutch** single dry disc operated by foot pedal **Brakes** wet disc hydraulically operated by two foot pedals which can be locked together **Steering** power assist **Turning radius** (on concrete surface with brake applied) right 142" *(3.60 m)* left 142" *(3.60 m)* (on concrete surface without brake) right 177" *(4.50 m)* left 177" *(4.50 m)* **Turning space diameter** (on concrete surface with brake applied) right 308" *(7.82 m)* left 308" *(7.82 m)* (on concrete surface without brake) right 378" *(9.60 m)* left 378" *(9.60 m)* **Power take-off** 540 rpm at 2383 engine rpm.

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump was 150°F *(65.7°C)*. Five gears were chosen between 15% slip and 10 mph *(16.1 km/h)*.

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)	Front Wheel Drive Engaged dB (A)
Maximum Available Power—Two Hours	96.0	95.5
75% of Pull at Maximum Power—Ten Hours		95.5
50% of Pull at Maximum Power—Two Hours		94.0
50% of Pull at Reduced Engine Speed—Two Hours		89.0
Bystander in 7th gear	86.0	

DRAWBAR PERFORMANCE (Front Wheel Drive Disengaged)

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr *(l/h)*	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Fuel Consumption Hp.hr/gal *(kW.h/l)*	Temp. °F *(°C)* Cooling med	Temp. °F *(°C)* Air wet bulb	Temp. °F *(°C)* Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power—Two Hours 4th Gear											
39.78 *(29.66)*	3009 *(13.38)*	4.96 *(7.98)*	2500	7.04	3.353 *(12.694)*	0.591 *(0.359)*	11.86 *(2.337)*	189 *(87.2)*	61 *(16.1)*	72 *(21.9)*	28.835 *(97.370)*
MAXIMUM POWER IN SELECTED GEARS											
29.26 *(21.82)*	4494 *(19.99)*	2.44 *(3.93)*	2605	14.90	2nd Gear			178 *(81.1)*	58 *(14.4)*	62 *(16.7)*	28.840 *(97.390)*
41.05 *(30.61)*	3100 *(13.79)*	4.97 *(7.99)*	2500	6.83	4th Gear			190 *(87.8)*	57 *(13.9)*	66 *(18.9)*	28.790 *(97.220)*

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi *(kPa)*	Two 16.9-28; 6; 16 *(110)*	Two 16.9-28; 6, 16 *(110)*
Ballast	—Liquid (each)	None	None
	—Test Equip. (each)	68 lb *(31 kg)*	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 9.5-24; 6; 16 *(110)*	Two 9.5-24; 6; 16 *(110)*
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	88 lb *(40 kg)*	None
Height of Drawbar		16.5 in *(420 mm)*	16.5 in *(420 mm)*
Static Weight with Operator	—Rear	3730 lb *(1692 kg)*	3595 lb *(1631 kg)*
	Front	2475 lb *(1123 kg)*	2300 lb *(1043 kg)*
	Total	6205 lb *(2815 kg)*	5895 lb *(2674 kg)*

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1395**.

LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
W. E. SPLINTER
L. L. BASHFORD
Board of Tractor Test Engineers

John Deere 2240 Diesel

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Roy G. Arnold, Director

NEBRASKA TRACTOR TEST 1395 — WHITE-ISEKI 2-45 DIESEL
20 SPEED

POWER TAKE-OFF PERFORMANCE

Power Hp *(kW)*	Crank shaft speed rpm	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temperature °F *(°C)* Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg *(kPa)*
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—670 rpm)								
43.73 *(32.61)*	2250	3.361 *(12.723)*	0.539 *(0.328)*	13.01 *(2.563)*	195 *(90.6)*	68 *(20.2)*	75 *(23.8)*	28.520 *(96.308)*
Standard Power take-off Speed (540 rpm)—One Hour								
36.62 *(27.31)*	1812	2.882 *(10.910)*	0.552 *(0.336)*	12.70 *(2.503)*	204 *(95.4)*	68 *(19.8)*	75 *(23.9)*	28.503 *(96.251)*
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
39.00 *(29.08)*	2360	2.872 *(10.872)*	0.516 *(0.314)*	13.58 *(2.675)*	185 *(85.0)*	68 *(20.0)*	76 *(24.4)*	....
0.00 *(0.00)*	2440	0.993 *(3.759)*	....	....	178 *(81.1)*	68 *(20.0)*	76 *(24.4)*	....
19.75 *(14.73)*	2390	1.772 *(6.708)*	0.629 *(0.383)*	11.14 *(2.196)*	181 *(82.8)*	69 *(20.6)*	78 *(25.6)*	....
44.05 *(32.85)*	2250	3.403 *(12.882)*	0.541 *(0.329)*	12.94 *(2.550)*	192 *(88.9)*	69 *(20.6)*	78 *(25.6)*	....
9.95 *(7.42)*	2408	1.340 *(5.072)*	0.944 *(0.574)*	7.43 *(1.463)*	179 *(81.4)*	70 *(21.1)*	81 *(26.9)*	....
29.43 *(21.95)*	2376	2.256 *(8.540)*	0.537 *(0.327)*	13.05 *(2.570)*	182 *(83.3)*	70 *(21.1)*	82 *(27.8)*	....
Av 23.70 *Av (17.67)*	**2371**	**2.106** *(7.972)*	**0.623** *(0.379)*	**11.25** *(2.217)*	**183** *(83.8)*	**69** *(20.6)*	**78** *(25.8)*	**28.510** *(96.274)*

DRAWBAR PERFORMANCE
(Front Wheel Drive Disengaged)

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temp. °F *(°C)* Cooling med	Air wet bulb	Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power—Two Hours 18th (3HH) Gear											
36.16 *(26.96)*	2360 *(10.50)*	5.75 *(9.25)*	2249	6.03	3.300 *(12.491)*	0.640 *(0.389)*	10.96 *(2.159)*	191 *(88.3)*	65 *(18.3)*	76 *(24.2)*	28.805 *(97.270)*
75% of Pull at Maximum Power—Ten Hours 18th (3HH) Gear											
29.89 *(22.29)*	1821 *(8.10)*	6.16 *(9.91)*	2364	4.22	2.718 *(10.290)*	0.637 *(0.388)*	11.00 *(2.166)*	187 *(86.0)*	74 *(23.3)*	83 *(28.3)*	28.728 *(97.010)*
50% of Pull at Maximum Power—Two Hours 18th (3HH) Gear											
20.34 *(15.17)*	1219 *(5.42)*	6.26 *(10.07)*	2379	3.38	2.105 *(7.967)*	0.725 *(0.441)*	9.66 *(1.903)*	184 *(84.2)*	73 *(22.5)*	82 *(27.5)*	28.530 *(96.342)*
50% of Pull at Reduced Engine Speed—Two Hours 19th (4HH) Gear											
20.42 *(15.22)*	1224 *(5.44)*	6.26 *(10.07)*	1534	3.23	1.891 *(7.157)*	0.649 *(0.395)*	10.80 *(2.127)*	189 *(87.2)*	75 *(23.6)*	87 *(30.6)*	28.510 *(96.274)*
MAXIMUM POWER IN SELECTED GEARS											
30.23 *(22.55)*	4455 *(19.82)*	2.54 *(4.10)*	2354	14.92		14th (5LH) Gear		185 *(84.7)*	71 *(21.7)*	75 *(23.9)*	28.560 *(96.445)*
34.26 *(25.55)*	4114 *(18.30)*	3.12 *(5.03)*	2251	12.56		15th (5HL) Gear		191 *(88.3)*	72 *(22.2)*	77 *(25.0)*	28.550 *(96.409)*
34.62 *(25.82)*	3813 *(16.96)*	3.40 *(5.48)*	2250	11.01		16th (1HH) Gear		194 *(90.0)*	72 *(22.2)*	79 *(26.1)*	28.550 *(96.409)*
37.32 *(27.83)*	3529 *(15.70)*	3.97 *(6.38)*	2250	9.74		17th (2HH) Gear		186 *(85.6)*	63 *(17.2)*	72 *(22.2)*	28.840 *(97.388)*
37.17 *(27.72)*	2420 *(10.77)*	5.76 *(9.27)*	2252	5.97		18th (3HH) Gear		187 *(86.1)*	61 *(16.1)*	68 *(20.0)*	28.820 *(97.321)*
35.88 *(26.75)*	1471 *(6.54)*	9.15 *(14.72)*	2251	3.63		19th (4HH) Gear		188 *(86.7)*	63 *(17.2)*	72 *(22.2)*	28.850 *(97.422)*

Department of Agricultural Engineering

Dates of Test: June 2-15, 1981

Manufacturer: ISEKI AND CO., LTD., Tokyo, Japan

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 46.3 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60° *(15°/15°)*** 0.8417 **Fuel weight** 7.008 lbs/gal *(0.840 kg/l)* **Oil** White Farm Equipment Turbo Diesel Oil **SAE 30 API service classification** SD-SE/CC-CD **To motor** 2.093 gal *(7.923 l)* **Drained from motor** 1.975 gal *(7.476 l)* **Transmission and final drive lubricant** White Farm Equipment Co. Universal tractor hydraulic transmission oil **Total time engine was operated** 37.5 hours

ENGINE: Make ISUZU Diesel **Model** 4BA1 **Type** four cylinder vertical **Serial No.** 604300 **Crankshaft** lengthwise **Rated rpm** 2250 **Bore and stroke** 3.858" × 3.62" *(98 mm × 92 mm)* **Compression ratio** 19 to 1 **Displacement** 169.3 cu in *(2775 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements **Oil filter** one paper element **Fuel filter** two paper elements with sediment bowl and screen **Muffler** vertical **Cooling medium temperature control** one thermostat.

CHASSIS: Type front wheel assist **Serial No.** 00198 K **Tread width** rear 55.5" *(1410 mm)* to 79.1" *(2010 mm)* front 59" *(1500 mm)* **Wheel base** 79.9" *(2030 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 33.9" *(861 mm)* Vertical distance above roadway 30.9" *(785 mm)* Horizontal distance from center of rear wheel tread 0" *(0 mm)* to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph *(km/h)*** first 0.2 *(0.3)* second 0.2 *(0.3)* third 0.3 *(0.4)* fourth 0.4 *(0.7)* fifth 0.7 *(1.1)* sixth 0.7 *(1.1)* seventh 0.8 *(1.3)* eighth 0.9 *(1.4)* ninth 1.0 *(1.6)* tenth 1.1 *(1.8)* eleventh 1.4 *(2.3)* twelfth 1.7 *(2.7)* thirteenth 2.2 *(3.5)* fourteenth 2.8 *(4.5)* fifteenth 3.5 *(5.6)* sixteenth 3.7 *(6.0)* seventeenth 4.3 *(6.9)* eighteenth 5.9 *(9.5)* nineteenth 9.2 *(14.8)* twentieth 14.7 *(23.6)* reverse 0.3 *(0.5)*, 1.2 *(1.9)*, 1.5 *(2.4)*, 6.4 *(10.3)* **Clutch** single dry disc operated by foot pedal **Brakes** multiple wet disc operated by two foot pedals which can be locked together and hand lever **Steering** power assist **Turning radius** (on concrete surface with brake applied) right 118" *(3.00 m)* left 118" *(3.00 m)* (on concrete surface without brake) right 137.8" *(3.50 m)* left 137.8" *(3.50 m)* **Turning space diameter** (on concrete surface with brake applied) right 240" *(6.10 m)* left 240" *(6.10 m)* (on concrete surface without brake) right 279.6" *(7.10 m)* left 279.6" *(7.10 m)* **Power take-off** 540 rpm at 1812 engine rpm.

LUGGING ABILITY IN 18th (3HH) GEAR

Crankshaft Speed rpm	2252	2029	1798	1577	1349	1125
Pull—lbs *(kN)*	2420 *(10.77)*	2470 *(10.99)*	2596 *(11.55)*	2671 *(11.88)*	2629 *(11.70)*	2544 *(11.32)*
Increase in Pull %	0	2	7	10	9	5
Power—Hp *(kW)*	37.17 *(27.72)*	34.13 *(25.45)*	31.67 *(23.61)*	28.50 *(21.26)*	24.01 *(17.90)*	19.42 *(14.48)*
Speed—Mph *(km/h)*	5.76 *(9.27)*	5.18 *(8.34)*	4.57 *(7.36)*	4.00 *(6.44)*	3.42 *(5.51)*	2.86 *(4.61)*
Slip %	5.97	6.09	6.43	6.67	6.67	6.32

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)	Front Wheel Drive Disengaged dB(A)
Maximum Available Power—Two Hours	90.0	90.0
75% of Pull at Maximum Power—Ten Hours		90.5
50% of Pull at Maximum Power—Two Hours		89.5
50% of Pull at Reduced Engine Speed—Two Hours		88.5
Bystander in 20th (5HH) gear		80.5

DRAWBAR PERFORMANCE
(Front Wheel Drive Engaged)

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption			Temp. °F (°C)			Barom. inch Hg *(kPa)*
					gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Cool-ing med	Air wet bulb	Air dry bulb	
Maximum Available Power—Two Hours 18th (3HH) Gear											
35.50 *(26.47)*	2255 *(10.03)*	5.90 *(9.50)*	2249	4.05	3.300 *(12.491)*	0.651 *(0.396)*	10.76 *(2.119)*	194 *(89.7)*	69 *(20.6)*	81 *(27.2)*	28.765 *(97.135)*

MAXIMUM POWER IN SELECTED GEARS

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Gear	Cool-ing med	Air wet bulb	Air dry bulb	Barom. inch Hg *(kPa)*
31.21 *(23.28)*	5834 *(25.95)*	2.01 *(3.23)*	2356	14.95	13th (4HL) Gear	186 *(85.3)*	70 *(21.1)*	73 *(22.8)*	28.570 *(96.477)*
37.78 *(28.18)*	3422 *(15.22)*	4.14 *(6.66)*	2251	6.30	17th (2HH) Gear	188 *(86.7)*	63 *(17.2)*	71 *(21.7)*	28.840 *(97.388)*
37.03 *(27.62,*	2355 *(10.47)*	5.90 *(9.49)*	2248	4.14	18th (3HH) Gear	187 *(86.1)*	62 *(16.7)*	70 *(21.1)*	28.830 *(97.355)*

TIRES, BALLAST AND WEIGHT		**With Ballast**	**Without Ballast**
Rear Tires	—No., size, ply & psi *(kPa)*	Two 14.9-28; 6; 16 *(110)*	Two 14.9-28; 6; 16 *(110)*
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	270 lb *(122 kg)*	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 8.3-24; 8; 22 *(150)*	Two 8.3-24; 8; 22 *(150)*
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	60 lb *(27 kg)*	None
Height of drawbar		17.5 in *(445 mm)*	17.5 in *(445 mm)*
Static Weight with Operator—Rear		4055 lb *(1839 kg)*	3515 lb *(1594 kg)*
Front		2575 lb *(1168 kg)*	2455 lb *(1114 kg)*
Total		6630 lb *(3007 kg)*	5970 lb *(2708 kg)*

REPAIRS and ADJUSTMENTS: After a short circuit during the run-in period, the wiring harness and starting switch were replaced.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump was 161°F *(71.9°C)*. Six gears were chosen between 15% slip and 10 mph *(16.1 km/h)*.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1395.**

LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
W. E. SPLINTER
L. L. BASHFORD
Board of Tractor Test Engineers

White-Iseki 2-45 Diesel

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Roy G. Arnold, Director

NEBRASKA TRACTOR TEST 1396 — WHITE-ISEKI 2-62 DIESEL 20 SPEED

POWER TAKE-OFF PERFORMANCE

Power Hp *(kW)*	Crank shaft speed rpm	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temperature °F (°C) Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg *(kPa)*
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—656 rpm)								
61.46 *(45.83)*	2200	3.814 *(14.438)*	0.435 *(0.265)*	16.11 *(3.174)*	187 *(86.3)*	63 *(17.3)*	75 *(23.9)*	28.823 *(97.332)*
Standard Power take-off Speed (540 rpm)—One Hour								
54.25 *(40.45)*	1813	3.326 *(12.590)*	0.430 *(0.261)*	16.31 *(3.213)*	195 *(90.5)*	63 *(17.2)*	75 *(24.1)*	28.835 *(97.371)*
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
53.42 *(39.84)*	2249	3.253 *(12.314)*	0.427 *(0.260)*	16.42 *(3.235)*	181 *(82.8)*	63 *(17.2)*	76 *(24.4)*	....
0.00 *(0.00)*	2424	1.040 *(3.937)*	....	....	177 *(80.6)*	63 *(17.2)*	76 *(24.2)*	....
27.70 *(20.66)*	2335	2.051 *(7.764)*	0.519 *(0.316)*	13.51 *(2.661)*	179 *(81.7)*	63 *(17.2)*	76 *(24.2)*	....
62.04 *(46.26)*	2200	3.844 *(14.551)*	0.434 *(0.264)*	16.14 *(3.179)*	185 *(85.0)*	63 *(17.2)*	76 *(24.2)*	....
14.11 *(10.52)*	2378	1.511 *(5.720)*	0.751 *(0.457)*	9.34 *(1.839)*	177 *(80.6)*	63 *(17.2)*	76 *(24.4)*	....
40.95 *(30.54)*	2300	2.616 *(9.903)*	0.448 *(0.272)*	15.66 *(3.084)*	181 *(82.8)*	64 *(17.5)*	77 *(25.0)*	....
Av 33.04 ***Av (24.64)***	**2314**	**2.386** ***(9.032)***	**0.506** ***(0.308)***	**13.85** ***(2.728)***	**180** ***(82.2)***	**63** ***(17.3)***	**76** ***(24.4)***	**28.827** ***(97.343)***

DRAWBAR PERFORMANCE
(Front Wheel Drive Disengaged)

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temp. °F (°C) Cool-ing med	Air wet bulb	Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power—Two Hours 18th (3HH) Gear											
51.53 *(38.43)*	3186 *(14.17)*	6.06 *(9.76)*	2200	6.05	3.746 *(14.179)*	0.509 *(0.310)*	13.76 *(2.710)*	185 *(84.7)*	65 *(18.3)*	75 *(23.9)*	28.315 *(97.304)*
75% of Pull at Maximum Power—Ten Hours 18th (3HH) Gear											
40.71 *(30.36)*	2402 *(10.68)*	6.36 *(10.23)*	2261	4.24	3.018 *(11.424)*	0.520 *(0.316)*	13.49 *(2.657)*	184 *(84.2)*	71 *(21.7)*	85 *(29.2)*	28.494 *(96.220)*
50% of Pull at Maximum Power—Two Hours 18th (3HH) Gear											
28.22 *(21.04)*	1600 *(7.12)*	6.61 *(10.64)*	2318	2.85	2.337 *(8.845)*	0.580 *(0.353)*	12.08 *(2.379)*	183 *(83.6)*	77 *(24.7)*	86 *(30.0)*	28.455 *(96.088)*
50% of Pull at Reduced Engine Speed—Two Hours 19th (4HH) Gear											
28.24 *(21.06)*	1604 *(7.13)*	6.60 *(10.63)*	1492	2.79	2.016 *(7.630)*	0.500 *(0.304)*	14.01 *(2.760)*	184 *(84.4)*	78 *(25.6)*	91 *(32.5)*	28.455 *(96.088)*
MAXIMUM POWER IN SELECTED GEARS											
43.96 *(32.78)*	4695 *(20.89)*	3.51 *(5.65)*	2247	14.96	16th (1HH) Gear			183 *(83.9)*	64 *(17.8)*	71 *(21.7)*	28.810 *(97.287)*
49.26 *(36.73)*	4570 *(20.33)*	4.04 *(6.51)*	2199	12.79	17th (2HH) Gear			186 *(85.6)*	74 *(23.3)*	82 *(27.8)*	28.450 *(96.070)*
51.63 *(38.50)*	3201 *(14.24)*	6.05 *(9.73)*	2198	6.30	18th (3HH) Gear			186 *(85.3)*	70 *(21.1)*	77 *(25.0)*	28.480 *(96.173)*
50.21 *(37.44)*	1949 *(8.67)*	9.66 *(15.54)*	2199	3.59	19th (4HH) Gear			187 *(86.1)*	74 *(23.3)*	83 *(28.3)*	28.450 *(96.071)*

LUGGING ABILITY IN 18th (3HH) GEAR

Crankshaft Speed rpm	2198	1981	1760	1542	1318	1098
Pull—lbs *(kN)*	3201 *(14.24)*	3362 *(14.96)*	3448 *(15.34)*	3462 *(15.40)*	3498 *(15.56)*	3417 *(15.20)*
Increase in Pull %	0	5	8	8	9	7
Power—Hp *(kW)*	51.63 *(38.50)*	48.64 *(36.27)*	44.18 *(32.95)*	38.89 *(29.00)*	33.54 *(25.01)*	27.36 *(20.40)*
Speed—Mph *(km/h)*	6.05 *(9.73)*	5.42 *(8.73)*	4.80 *(7.73)*	4.21 *(6.78)*	3.60 *(5.79)*	3.00 *(4.83)*
Slip %	6.30	6.74	6.99	6.99	6.99	6.74

Department of Agricultural Engineering

Detes of Test: June 2-11, 1981

Manufacturer: ISEKI AND CO., LTD., Tokyo, Japan

FUEL, OIL AND TIME: **Fuel** No. 2 Diesel **Cetane No.** 46.3 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60°** *(15°/15°)* 0.8417 **Fuel weight** 7.008 lbs/gal *(0.840 kg/l)* **Oil** White Farm Equipment Turbo Diesel Oil **SAE** 30 **API service classification** SD-SE/CC-CD **To motor** 2.162 gal *(8.184 l)* **Drained from motor** 2.055 gal *(7.779 l)* **Transmission and final drive lubricant** White Farm Equipment Co. Universal tractor hydraulic transmission fluid **Total time engine was operated** 37.5 hours

ENGINE: **Make** ISUZU Diesel **Model** 4BB1 **Type** four cylinder vertical **Serial No.** 505944 **Crankshaft** lengthwise **Rated rpm** 2200 **Bore and stroke** 4.016" × 4.33" *(102 mm × 110 mm)* **Compression ratio** 17.5 to 1 **Displacement** 219 cu in *(3595 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements **Oil filter** one paper element **Fuel filter** two paper elements and sediment bowl with screen **Muffler** vertical **Cooling medium temperature control** one thermostat.

CHASSIS: **Type** front wheel assist **Serial No.** 00486K **Tread width** rear 55.5" *(1410 mm)* to 79.1" *(2010 mm)* front 59" *(1500 mm)* **Wheel base** 84.4" *(2145 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 36.9" *(938 mm)* Vertical distance above roadway 33.7" *(855 mm)* Horizontal distance from center of rear wheel tread 0" *(0 mm)* to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph *(km/h)*** first 0.2 *(0.3)* second 0.2 *(0.3)* third 0.3 *(0.4)* fourth 0.4 *(0.7)* fifth 0.7 *(1.1)* sixth 0.7 *(1.2)* seventh 0.8 *(1.4)* eighth 0.9 *(1.5)* ninth 1.1 *(1.8)* tenth 1.2 *(1.9)* eleventh 1.5 *(2.4)* twelfth 1.8 *(2.9)* thirteenth 2.3 *(3.7)* fourteenth 2.9 *(4.7)* fifteenth 3.6 *(5.8)* sixteenth 3.9 *(6.3)* seventeenth 4.4 *(7.1)* eighteenth 6.2 *(10.0)* nineteenth 9.6 *(15.4)* twentieth 15.3 *(24.6)* reverse 0.3 *(0.5)*, 1.3 *(2.1)*, 1.6 *(2.6)*, 6.7 *(10.8)* **Clutch** single dry disc operated by foot pedal **Brakes** multiple wet disc operated by two foot pedals which can be locked together and hand lever **Steering** power assist **Turning radius** (on concrete surface with brake applied) right 126" *(3.20 m)* left 126" *(3.20 m)* (on concrete surface without brake) right 146" *(3.70 m)* left 146" *(3.70 m)* **Turning space diameter** (on concrete surface with brake applied) right 260" *(6.60 m)* left 260" *(6.60 m)* (on concrete surface without brake) right 307" *(7.80 m)* left 307" *(7.80 m)* **Power take-off** 540 rpm at 1813 engine rpm.

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)	Front Wheel Drive Disengaged dB(A)
Maximum Available Power—Two Hours	93.5	93.5
75% of Pull at Maximum Power—Ten Hours		93.0
50% of Pull at Maximum Power—Two Hours		91.5
50% of Pull at Reduced Engine Speed—Two Hours		90.0
Bystander in 20th (5HH) gear		83.0

DRAWBAR PERFORMANCE
(Front Wheel Drive Engaged)

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temp. °F (°C) Cool-ing med	Air wet bulb	Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power—Two Hours 18th (3HH) Gear											
50.92 *(37.97)*	3090 *(13.75)*	6.18 *(9.94)*	2200	4.16	3.657 *(13.841)*	0.503 *(0.306)*	13.92 *(2.742)*	187 *(85.3)*	61 *(15.8)*	82 *(27.5)*	28.840 *(97.388)*
MAXIMUM POWER IN SELECTED GEARS											
43.35 *(32.33)*	6201 *(27.58)*	2.62 *(4.22)*	2252	14.98	14th (5LH) Gear			182 *(83.3)*	62 *(16.7)*	67 *(19.4)*	28.800 *(97.253)*
51.96 *(38.75)*	3159 *(14.05)*	6.17 *(9.93)*	2199	4.36	18th (3HH) Gear			187 *(86.1)*	72 *(22.2)*	80 *(26.7)*	28.460 *(96.105)*

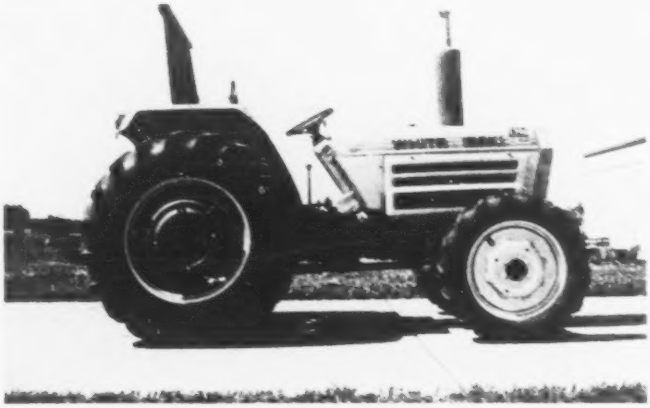
TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi *(kPa)*	Two 16.9-30; 6; 16 *(110)*	Two 16.9-30; 6; 16 *(110)*
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	275 lb *(125 kg)*	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 9.5-24; 8; 22 *(150)*	Two 9.5-24; 8; 22 *(150)*
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	42 lb *(19 kg)*	None
Height of drawbar		20 in *(510 mm)*	20 in *(510 mm)*
Static Weight with Operator	—Rear	4190 lb *(1901 kg)*	3640 lb *(1651 kg)*
	Front	2685 lb *(1218 kg)*	2600 lb *(1179 kg)*
	Total	6875 lb *(3119 kg)*	6240 lb *(2830 kg)*

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump was 157°F *(69.6°C)*. Four gears were chosen between 15% slip and 10 mph *(16.1 km/h)*.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1396.**

LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
W. E. SPLINTER
L. L. BASHFORD
Board of Tractor Test Engineers



White-Iseki 2-62 Diesel

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Roy G. Arnold, Director

NEBRASKA TRACTOR TEST 1397 — ALLIS CHALMERS 6060 DIESEL
8 SPEED

POWER TAKE-OFF PERFORMANCE

Power Hp *(kW)*	Crank shaft speed rpm	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temperature °F (°C) Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg *(kPa)*
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—558 rpm)								
63.83 *(47.60)*	2300	4.035 *(15.274)*	0.443 *(0.270)*	15.82 *(3.116)*	183 *(84.1)*	65 *(18.6)*	75 *(23.7)*	28.823 *(97.332)*
Standard Power take-off Speed (540 rpm)—One Hour								
64.90 *(48.40)*	2226	3.992 *(15.111)*	0.431 *(0.262)*	16.26 *(3.203)*	184 *(84.3)*	66 *(18.9)*	75 *(23.9)*	28.775 *(97.169)*
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
57.56 *(42.92)*	2440	3.915 *(14.820)*	0.477 *(0.290)*	14.70 *(2.896)*	180 *(81.9)*	66 *(18.9)*	75 *(23.9)*	....
0.00 *(0.00)*	2542	1.421 *(5.379)*	....	....	170 *(76.7)*	67 *(19.4)*	76 *(24.2)*	....
29.47 *(21.98)*	2499	2.674 *(10.122)*	0.636 *(0.387)*	11.02 *(2.172)*	176 *(80.0)*	67 *(19.4)*	76 *(24.2)*	....
63.98 *(47.71)*	2300	4.035 *(15.274)*	0.442 *(0.269)*	15.86 *(3.124)*	184 *(84.4)*	67 *(19.4)*	75 *(23.9)*	....
14.87 *(11.09)*	2521	2.011 *(7.612)*	0.948 *(0.577)*	7.39 *(1.457)*	171 *(77.2)*	67 *(19.2)*	75 *(23.9)*	....
43.76 *(32.63)*	2472	3.312 *(12.537)*	0.531 *(0.323)*	13.21 *(2.603)*	179 *(81.7)*	66 *(18.9)*	75 *(23.9)*	....
Av 34.94 ***Av (26.05)***	**2462**	**2.895** ***(10.959)***	**0.581** ***(0.353)***	**12.07** ***(2.377)***	**177** ***(80.3)***	**67** ***(19.2)***	**75** ***(24.0)***	**28.813** ***(97.298)***

DRAWBAR PERFORMANCE

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temp. °F (°C) Cool-ing med	Air wet bulb	Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power—Two Hours 5th (1-H) Gear											
50.87 *(37.93)*	3949 *(17.57)*	4.83 *(7.77)*	2298	6.28	3.833 *(14.510)*	0.528 *(0.321)*	13.27 *(2.614)*	185 *(84.7)*	60 *(15.6)*	81 *(27.2)*	28.935 *(97.709)*
75% of Pull at Maximum Power—Ten Hours 5th (1-H) Gear											
42.67 *(31.82)*	3041 *(13.53)*	5.25 *(8.47)*	2453	4.32	3.559 *(13.471)*	0.585 *(0.356)*	11.99 *(2.362)*	182 *(83.4)*	61 *(16.1)*	79 *(26.1)*	28.803 *(97.263)*
50% of Pull at Maximum Power—Two Hours 5th (1-H) Gear											
29.34 *(21.88)*	2031 *(9.03)*	5.42 *(8.72)*	2489	2.83	2.906 *(11.001)*	0.694 *(0.422)*	10.10 *(1.989)*	178 *(81.1)*	63 *(17.2)*	75 *(23.9)*	28.810 *(97.287)*
50% of Pull at Reduced Engine Speed—Two Hours 6th (2-H) Gear											
29.42 *(21.93)*	2031 *(9.03)*	5.43 *(8.74)*	1729	2.72	2.157 *(8.166)*	0.514 *(0.313)*	13.63 *(2.686)*	180 *(81.9)*	63 *(17.2)*	80 *(26.7)*	28.810 *(97.287)*
MAXIMUM POWER IN SELECTED GEARS											
34.39 *(25.64)*	6846 *(30.45)*	1.88 *(3.03)*	2468	14.94	2nd (2-L) Gear			178 *(80.8)*	61 *(16.1)*	71 *(21.7)*	28.800 *(97.253)*
47.57 *(35.48)*	6662 *(29.63)*	2.68 *(4.31)*	2299	12.99	3rd (3-L) Gear			181 *(82.5)*	60 *(15.6)*	67 *(19.4)*	28.770 *(97.152)*
50.23 *(37.46)*	5179 *(23.04)*	3.64 *(5.85)*	2300	8.63	4th (4-L) Gear			185 *(84.7)*	58 *(14.4)*	76 *(24.4)*	28.950 *(97.760)*
52.24 *(38.96)*	4054 *(18.03)*	4.83 *(7.78)*	2300	6.32	5th (1-H) Gear			185 *(85.0)*	58 *(14.4)*	75 *(23.9)*	28.960 *(97.794)*
51.83 *(38.65)*	2722 *(12.11)*	7.14 *(11.49)*	2300	3.88	6th (2-H) Gear			184 *(84.4)*	58 *(14.4)*	77 *(25.0)*	28.940 *(97.726)*

LUGGING ABILITY IN 5th (1-H) GEAR

Crankshaft Speed rpm	2300	2072	1844	1611	1384	1150
Pull—lbs *(kN)*	4054 *8.03)*	5013 *(22.30)*	5241 *(23.32)*	5458 *(24.28)*	5467 *(24.32)*	5075 *(22.57)*
Increase in Pull %	0	24	29	35	35	25
Power—Hp *(kW)*	2.24 *3.96)*	57.05 *(42.55)*	52.74 *(39.33)*	47.62 *(35.51)*	40.89 *(30.49)*	31.90 *(23.79)*
Speed—Mph *(km/h)*	4.83 *(7.78)*	4.27 *(6.87)*	3.77 *(6.07)*	3.27 *(5.27)*	2.80 *(4.51)*	2.36 *(3.79)*
Slip %	6.32	8.13	8.63	9.38	9.63	8.51

Department of Agricultural Engineering

Dates of Test: June 9-22, 1981

Manufacturer: ALLIS CHALMERS CORPORATION, P.O. Box 512, Milwaukee, Wisconsin 53201

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 46.3 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60°** *(15°/15°)* 0.8420 **Fuel weight** 7.011 lbs/gal *(0.840 kg/l)* **Oil SAE** 15W40 **API service classification** SE-CD **To motor** 2.498 gal *(9.456 l)* **Drained from motor** 2.297 gal *(8.695 l)* **Transmission and final drive lubricant** A. C. Power Fluid 821 **Total time engine was operated** 37.5 hours

ENGINE: Make Allis Chalmers Diesel **Type** four cylinder vertical with turbocharger **Serial No.** 33-09171 **Crankshaft** lengthwise **Rated rpm** 2300 **Bore and stroke** 3.876" × 4.250" *(98.4 mm × 107.9 mm)* **Compression ratio** 14.1 to 1 **Displacement** 200 cu in *(3287 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** one paper element with centrifugal precleaner **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil **Fuel filter** one paper cartridge **Muffler** vertical **Cooling medium temperature control** one thermostat.

CHASSIS: Type standard **Serial No.** 6060 1336 **Tread width** rear 56.9" *(1445 mm)* to 88.9" *(2258 mm)* front 56" *(1422 mm)* to 79" *(2006 mm)* **Wheel base** 92.6" *(2352 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 30.6" *(778 mm)* Vertical distance above roadway 34.8" *(883 mm)* Horizontal distance from center of rear wheel tread 0" *(0 mm)* to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph *(km/h)*** first 1.5 *(2.4)* second 2.1 *(3.4)* third 3.2 *(5.1)* fourth 4.1 *(6.6)* fifth 5.4 *(8.6)* sixth 7.7 *(12.4)* seventh 11.5 *(18.5)* eighth 14.9 *(23.9)* reverse 1.9 *(3.0)*, 6.9 *(11.1)* **Clutch** dry single disc operated by foot pedal **Brakes** multiple wet disc hydraulically operated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 131.5" *(3.34 m)* left 135.0" *(3.43 m)* (on concrete surface without brake) right 146.0" *(3.71 m)* left 149.7" *(3.80 m)* **Turning space diameter** (on concrete surface with brake applied) right 278.0" *(7.06 m)* left 286.0" *(7.26 m)* (on concrete surface without brake) right 307.0" *(7.80 m)* left 314.5" *(7.99 m)* **Power take-off** 540 rpm at 2226 engine rpm

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)
Maximum Available Power—Two Hours	92.0
75% of Pull at Maximum Power—Ten Hours	91.0
50% of Pull at Maximum Power—Two Hours	91.0
50% of Pull at Reduced Engine Speed—Two Hours	88.5
Bystander in 8th (4-H) gear	85.5

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi *(kPa)*	Two 15.5-38, 6; 18 *(125)*	Two 15.5-38; 6; 18 *(125)*
Ballast	—Liquid (each)	638 lb *(289 kg)*	None
	—Cast Iron (each)	550 lb *(249 kg)*	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 7.50-16, 6; 36 *(250)*	Two 7.50-16, 6, 36 *(250)*
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	52 lb *(24 kg)*	None
Height of Drawbar		20.5 in *(520 mm)*	20.5 in *(520 mm)*
Static Weight with Operator	—Rear	6700 lb *(3039 kg)*	4325 lb *(1962 kg)*
	Front	2245 lb *(1018 kg)*	2140 lb *(971 kg)*
	Total	8945 lb *(4057 kg)*	6465 lb *(2933 kg)*

procedure. Temperature at injection pump return was 136°F *(57.6°C)*. Five gears were chosen between 15% slip and 10 mph *(16.1 km/h)*.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1397.**

LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
W. E. SPLINTER
L. L. BASHFORD
Board of Tractor Test Engineers

Allis Chalmers 6060 Diesel

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Roy G. Arnold, Director

NEBRASKA TRACTOR TEST 1398 — ALLIS CHALMERS 6080 DIESEL 12 SPEED

POWER TAKE-OFF PERFORMANCE

	Power Hp *(kW)*	Crank shaft speed rpm	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temperature °F *(°C)* Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg *(kPa)*
MAXIMUM POWER AND FUEL CONSUMPTION									
Rated Engine Speed—Two Hours (PTO Speed—955 rpm)									
	83.66 *(62.39)*	2300	5.016 *(18.988)*	0.420 *(0.256)*	16.68 *(3.286)*	188 *(86.4)*	66 *(18.9)*	75 *(23.9)*	28.767 *(97.141)*
Standard Power take-off Speed (1000 rpm)—One Hour									
	74.49 *(55.55)*	2408	4.745 *(17.962)*	0.447 *(0.272)*	15.70 *(3.093)*	184 *(84.3)*	66 *(18.8)*	75 *(23.9)*	28.795 *(97.236)*
VARYING POWER AND FUEL CONSUMPTION—Two Hours									
	74.43 *(55.50)*	2408	4.737 *(17.931)*	0.446 *(0.271)*	15.71 *(3.095)*	184 *(84.4)*	66 *(18.9)*	75 *(23.6)*	....
	0.00 *(0.00)*	2567	1.532 *(5.799)*	....	....	174 *(78.9)*	65 *(18.3)*	75 *(23.6)*	....
	38.69 *(28.85)*	2500	3.222 *(12.197)*	0.584 *(0.355)*	12.01 *(2.365)*	180 *(82.2)*	65 *(18.3)*	75 *(23.9)*	....
	83.83 *(62.51)*	2300	5.002 *(18.935)*	0.418 *(0.255)*	16.76 *(3.301)*	187 *(86.1)*	66 *(18.9)*	75 *(23.9)*	....
	19.59 *(14.61)*	2536	2.345 *(8.877)*	0.839 *(0.511)*	8.35 *(1.646)*	175 *(79.4)*	66 *(18.9)*	75 *(23.9)*	....
	57.03 *(42.53)*	2460	3.979 *(15.062)*	0.489 *(0.298)*	14.33 *(2.824)*	182 *(83.3)*	66 *(18.9)*	77 *(24.7)*	....
Av ***Av***	**45.60** ***(34.00)***	**2462**	**3.470** ***(13.135)***	**0.534** ***(0.325)***	**13.14** ***(2.589)***	**180** ***(82.4)***	**66** ***(18.7)***	**75** ***(23.9)***	**28.817** ***(97.310)***

DRAWBAR PERFORMANCE

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temp. °F *(°C)* Cool-ing med	Air wet bulb	Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power—Two Hours 8th (4-I) Gear											
70.50 *(52.57)*	4609 *(20.50)*	5.74 *(9.23)*	2301	5.30	4.939 *(18.695)*	0.491 *(0.299)*	14.27 *(2.812)*	189 *(87.2)*	62 *(16.4)*	77 *(25.0)*	28.790 *(97.220)*
75% of Pull at Maximum Power—Ten Hours 8th (4-I) Gear											
57.00 *(42.50)*	3469 *(15.43)*	6.16 *(9.91)*	2429	3.70	4.450 *(16.846)*	0.547 *(0.333)*	12.81 *(2.523)*	184 *(84.7)*	57 *(13.9)*	71 *(21.9)*	29.069 *(98.162)*
50% of Pull at Maximum Power—Two Hours 8th (4-I) Gear											
39.37 *(29.36)*	2326 *(10.35)*	6.35 *(10.21)*	2478	2.69	3.601 *(13.633)*	0.641 *(0.390)*	10.93 *(2.153)*	184 *(84.4)*	66 *(18.6)*	85 *(29.2)*	28.745 *(97.068)*
50% of Pull at Reduced Engine Speed—Two Hours 9th (1-H) Gear											
39.29 *(29.30)*	2319 *(10.32)*	6.35 *(10.22)*	1734	2.58	2.657 *(10.056)*	0.474 *(0.288)*	14.79 *(2.913)*	185 *(84.7)*	66 *(18.6)*	90 *(31.9)*	28.725 *(97.000)*
MAXIMUM POWER IN SELECTED GEARS											
62.72 *(46.77)*	9003 *(40.05)*	2.61 *(4.20)*	2377	14.92	5th (1-I) Gear			183 *(83.9)*	55 *(12.8)*	64 *(17.8)*	28.900 *(97.591)*
68.93 *(51.40)*	7386 *(32.85)*	3.50 *(5.63)*	2300	9.66	6th (2-I) Gear			187 *(85.8)*	60 *(15.6)*	71 *(21.7)*	28.850 *(97.422)*
70.65 *(52.68)*	5852 *(26.03)*	4.53 *(7.29)*	2302	6.55	7th (3-I) Gear			188 *(86.4)*	59 *(15.0)*	70 *(21.1)*	28.860 *(97.456)*
72.32 *(53.93)*	4725 *(21.02)*	5.74 *(9.24)*	2302	5.37	8th (4-I) Gear			184 *(84.4)*	56 *(13.3)*	68 *(20.0)*	28.920 *(97.659)*
71.80 *(53.54)*	3218 *(14.32)*	8.37 *(13.46)*	2298	3.28	9th (1-H) Gear			187 *(86.1)*	60 *(15.6)*	68 *(20.0)*	28.870 *(97.490)*

LUGGING ABILITY IN 8th (4-I) GEAR

Crankshaft Speed rpm	2302	2070	1836	1612	1386	1152
Pull—lbs *(kN)*	4725 *(21.02)*	5317 *(23.65)*	5755 *(25.60)*	6000 *(26.69)*	5942 *(26.43)*	5072 *(22.56)*
Increase in Pull %	0	13	22	27	26	7
Power—Hp *(kW)*	72.32 *(53.93)*	72.64 *(54.17)*	69.32 *(51.69)*	63.26 *(47.17)*	53.88 *(40.18)*	38.65 *(28.82)*
Speed—Mph *(km/h)*	5.74 *(9.24)*	5.12 *(8.25)*	4.52 *(7.27)*	3.95 *(6.36)*	3.40 *(5.47)*	2.86 *(4.60)*
Slip %	5.37	5.99	6.55	6.82	6.82	5.86

Department of Agricultural Engineering

Dates of Test: June 8-20, 1981

Manufacturer: ALLIS CHALMERS CORPORATION, P.O. Box 512, Milwaukee, Wisconsin 53201

FUEL, OIL AND TIME: **Fuel** No. 2 Diesel **Cetane No.** 46.3 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60°** ***(15°/15°)*** 0.8420 **Fuel weight** 7.011 lbs/gal *(0.840 kg/l)* **Oil SAE** 15W40 **API service classification** SE-CD **To motor** 2.529 gal *(9.573 l)* **Drained from motor** 2.691 gal *(10.187 l)* **Transmission and final drive lubricant** A. C. Power Fluid 821 **Total time engine was operated** 40.0 hours

ENGINE: **Make** Allis Chalmers Diesel **Type** four cylinder vertical with turbocharger and intercooler **Serial No.** 33-05899 **Crankshaft** lengthwise **Rated rpm** 2300 **Bore and stroke** 3.876" × 4.25" *(98.4 mm × 107.9 mm)* **Compression ratio** 14.1 to 1 **Displacement** 200 cu in *(3287 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** one paper element with centrifugal precleaner **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil **Fuel filter** one paper cartridge **Muffler** vertical **Cooling medium temperature control** one thermostat.

CHASSIS: **Type** standard **Serial No.** 6080 1265 **Tread width** rear 60.6" *(1538 mm)* to 84.6" *(2148 mm)* front 60" *(1524 mm)* to 88" *(2235 mm)* **Wheel base** 96" *(2438 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 29.3" *(744 mm)* Vertical distance above roadway 35.4" *(899 mm)* Horizontal distance from center of rear wheel tread 0" *(0 mm)* to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph** ***(km/h)*** first 1.0 *(1.6)* second 1.4 *(2.2)* third 1.7 *(2.7)* fourth 2.1 *(3.4)* fifth 3.0 *(4.9)* sixth 4.0 *(6.4)* seventh 5.0 *(8.0)* eighth 6.2 *(10.0)* ninth 8.8 *(14.2)* tenth 11.5 *(18.6)* eleventh 14.4 *(23.2)* twelfth 18.0 *(29.0)* reverse 1.0 *(1.6)*, 2.9 *(4.6)*, 8.4 *(13.4)* **Clutch** single dry disc operated by foot pedal **Brakes** multiple wet disc hydraulically operated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 143" *(3.63 m)* left 145" *(3.68 m)* (on concrete surface without brake) right 155" *(3.94 m)* left 157" *(3.98 m)* **Turning space diameter** (on concrete surface with brake applied) right 304" *(7.72 m)* left 307" *(7.81 m)* (on concrete surface without brake) right 328" *(8.34 m)* left 331" *(8.41 m)* **Power take-off** 1000 rpm at 2408 engine rpm and 540 rpm at 2124 engine rpm.

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)
Maximum Available Power—Two Hours	93.0
75% of Pull at Maximum Power—Ten Hours	92.0
50% of Pull at Maximum Power—Two Hours	91.0
50% of Pull at Reduced Engine Speed—Two Hours	89.0
Bystander in 12th (4-H) gear	86.0

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi *(kPa)*	Two 18.4-34; 8; 18 *(125)*	Two 18.4-34; 8; 18 *(125)*
Ballast	—Liquid (each)	1048 lb *(475 kg)*	None
	—Cast Iron (each)	1000 lb *(454 kg)*	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 7.50-16; 6; 36 *(250)*	Two 7.50-16; 6; 36 *(250)*
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	52 lb *(24 kg)*	None
Height of Drawbar		19.5 in *(495 mm)*	19.5 in *(495 mm)*
Static Weight with Operator	—Rear	9365 lb *(4248 kg)*	5270 lb *(2391 kg)*
	Front	2425 lb *(1100 kg)*	2320 lb *(1052 kg)*
	Total	11790 lb *(5348 kg)*	7590 lb *(3443 kg)*

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump return was 144°F *(62.0°C)*. Five gears were chosen between 15% slip and 10 mph *(16.1 km/h)*.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1398.**

LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
W. E. SPLINTER
L. L. BASHFORD
Board of Tractor Test Engineers

Allis Chalmers 6080 Diesel

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Roy G. Arnold, Director

NEBRASKA TRACTOR TEST 1399 — MASSEY FERGUSON MF 2805 DIESEL 8 SPEED

POWER TAKE-OFF PERFORMANCE

Power Hp *(kW)*	Crank shaft speed rpm	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temperature °F *(°C)* Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg *(kPa)*
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—1196 rpm)								
190.81 *(142.29)*	2500	12.991 *(49.176)*	0.477 *(0.290)*	14.69 *(2.893)*	189 *(87.4)*	59 *(15.1)*	75 *(23.8)*	28.920 *(97.659)*
Standard Power take-off Speed (1000 rpm)—One Hour								
186.29 *(138.92)*	2091	11.227 *(42.499)*	0.422 *(0.257)*	16.59 *(3.269)*	190 *(87.6)*	60 *(15.3)*	75 *(23.8)*	28.920 *(97.659)*
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
168.69 *(125.79)*	2600	12.357 *(46.776)*	0.513 *(0.312)*	13.65 *(2.689)*	187 *(86.1)*	60 *(15.3)*	75 *(23.9)*	....
0.00 *(0.00)*	2784	5.081 *(19.234)*	....	....	178 *(81.1)*	59 *(15.0)*	74 *(23.3)*	....
87.81 *(65.48)*	2706	8.732 *(33.054)*	0.697 *(0.424)*	10.06 *(1.981)*	185 *(84.7)*	60 *(15.6)*	75 *(23.9)*	....
191.71 *(142.96)*	2500	13.059 *(49.434)*	0.477 *(0.290)*	14.68 *(2.892)*	191 *(88.1)*	60 *(15.6)*	76 *(24.2)*	....
44.27 *(33.01)*	2738	6.853 *(25.941)*	1.085 *(0.660)*	6.46 *(1.273)*	182 *(83.1)*	60 *(15.6)*	75 *(23.9)*	....
129.37 *(96.47)*	2662	10.589 *(40.084)*	0.574 *(0.349)*	12.22 *(2.407)*	186 *(85.6)*	60 *(15.6)*	75 *(23.9)*	....
Av 103.64 ***Av (77.28)***	**2665**	**9.445** ***(35.753)***	**0.639** ***(0.389)***	**10.97** ***(2.161)***	**185** ***(84.8)***	**60** ***(15.4)***	**75** ***(23.8)***	**28.910** ***(97.625)***

DRAWBAR PERFORMANCE

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temp. °F *(°C)* Cooling med	Air wet bulb	Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power—Two Hours 5th Gear											
160.48 *(119.67)*	11124 *(49.48)*	5.41 *(8.71)*	2499	6.73	12.930 *(48.945)*	0.565 *(0.344)*	12.41 *(2.445)*	194 *(90.0)*	60 *(15.6)*	81 *(26.9)*	28.930 *(97.692)*
75% of Pull at Maximum Power—Ten Hours 5th Gear											
131.84 *(98.32)*	8555 *(38.05)*	5.78 *(9.30)*	2613	4.68	11.539 *(43.679)*	0.613 *(0.373)*	11.43 *(2.251)*	195 *(90.7)*	74 *(23.3)*	87 *(30.4)*	28.806 *(97.274)*
50% of Pull at Maximum Power—Two Hours 5th Gear											
91.58 *(68.29)*	5717 *(25.43)*	6.01 *(9.67)*	2674	3.08	9.559 *(36.185)*	0.732 *(0.445)*	9.58 *(1.887)*	187 *(86.1)*	63 *(17.2)*	86 *(29.7)*	28.935 *(97.709)*
50% of Pull at Reduced Engine Speed—Two Hours 6th Gear											
91.53 *(68.25)*	5701 *(25.36)*	6.02 *(9.69)*	1932	3.08	7.134 *(27.004)*	0.546 *(0.332)*	12.83 *(2.527)*	188 *(86.7)*	65 *(18.1)*	88 *(30.8)*	28.930 *(97.692)*
MAXIMUM POWER IN SELECTED GEARS											
146.88 *(109.53)*	17647 *(78.50)*	3.12 *(5.02)*	2591	14.63	3rd Gear			189 *(86.9)*	71 *(21.7)*	79 *(26.1)*	28.830 *(97.355)*
163.66 *(122.04)*	13286 *(59.10)*	4.62 *(7.43)*	2500	8.03	4th Gear			192 *(88.6)*	59 *(15.0)*	76 *(24.4)*	28.900 *(97.591)*
164.58 *(122.73)*	11397 *(50.70)*	5.41 *(8.71)*	2499	6.54	5th Gear			191 *(88.3)*	59 *(15.0)*	73 *(22.8)*	28.890 *(97.557)*
164.36 *(122.57)*	8032 *(35.73)*	7.67 *(12.35)*	2501	4.45	6th Gear			192 *(88.6)*	59 *(15.0)*	77 *(25.0)*	28.920 *(97.659)*

LUGGING ABILITY IN 5th GEAR

Crankshaft Speed rpm	2499	2254	1998	1746	1491	1247
Pull—lbs *(kN)*	11397 *(50.70)*	12669 *(56.35)*	13594 *(60.47)*	14155 *(62.96)*	14166 *(63.01)*	13375 *(59.50)*
Increase in Pull %	0	11	19	24	24	17
Power—Hp *(kW)*	164.58 *(122.73)*	163.44 *(121.87)*	154.17 *(114.96)*	139.39 *(103.95)*	118.90 *(88.66)*	94.58 *(70.52)*
Speed—Mph *(km/h)*	5.41 *(8.71)*	4.84 *(7.79)*	4.25 *(6.84)*	3.69 *(5.94)*	3.15 *(5.07)*	2.65 *(4.27)*
Slip %	6.54	7.44	8.17	8.76	9.04	8.32

Department of Agricultural Engineering

Dates of Test: June 18-24, 1981

Manufacturer: MASSEY FERGUSON, INC.,
1901 Bell Avenue, Des Moines, Iowa 50315

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 46.3 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60°** ***(15°/15°)*** 0.8418 **Fuel weight** 7.009 lbs/gal *(0.840 kg/l)* **Oil SAE** 20-20W **API service classification** SB/SE-CA/CD **To motor** 5.393 gal *(20.415 l)* **Drained from motor** 4.924 gal *(18.639 l)* **Transmission and final drive lubricant** Massey Ferguson Permatran fluid **Total time engine was operated** 32.5 hours.

ENGINE: Make Perkins Diesel **Type** eight cylinder vee with turbocharger **Serial No.** ZB31068U512277G **Crankshaft** lengthwise **Rated rpm** 2500 **Bore and stroke** 4.63" × 4.75" *(117.6 mm × 120.6 mm)* **Compression ratio** 15 to 1 **Displacement** 640 cu in *(10484 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements with aspirator **Oil filter** two full flow cartridges **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** two paper cartridges **Muffler** vertical **Cooling medium temperature control** four thermostats.

CHASSIS: Type standard with duals **Serial No.** 9R010458 **Tread width** rear 71" *(1803 mm)* to 126" *(3200 mm)* front 63" *(1600 mm)* to 83" *(2110 mm)* **Wheel base** 110" *(2794 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 35.9" *(912 mm)* Vertical distance above roadway 40.6" *(1031 mm)* Horizontal distance from center of rear wheel tread 0" *(0 mm)* to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph** ***(km/h)*** first 1.7 *(2.7)* second 2.4 *(3.9)* third 3.4 *(5.5)* fourth 4.9 *(7.9)* fifth 5.7 *(9.2)* sixth 7.9 *(12.7)* seventh 11.5 *(18.5)* eighth 16.4 *(26.4)* reverse 2.0 *(3.2)*, 2.8 *(4.5)*, 4.0 *(6.4)*, 5.8 *(9.3)*, 6.6 *(10.6)*, 9.2 *(14.8)* **Clutch** double dry disc operated by foot pedal **Brakes** single wet disc hydraulically power actuated and operated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 152" *(3.86 m)* left 152" *(3.86 m)* (on concrete surface without brake) right 202" *(5.13 m)* left 202" *(5.13 m)* **Turning space diameter** (on concrete surface with brake applied) right 330" *(8.38 m)* left 330" *(8.38 m)* (on concrete surface without brake) right 428" *(10.87 m)* left 428" *(10.87 m)* **Power take-off** 1000 rpm at 2091 engine rpm.

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)
Maximum Available Power—Two Hours	99.0
75% of Pull at Maximum Power—Ten Hours	100.5
50% of Pull at Maximum Power—Two Hours	100.0
50% of Pull at Reduced Engine Speed—Two Hours	95.5
Bystander in 8th gear	92.5

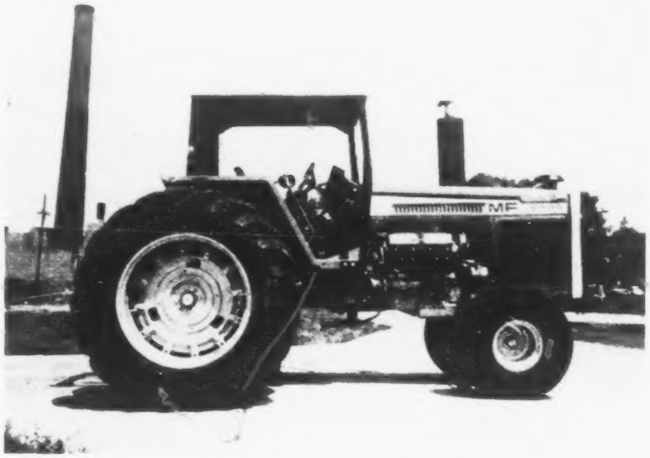
TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi *(kPa)*	Four 20.8-38; 10; 14 *(95)*	Four 20.8-38; 10; 14 *(95)*
Ballast	—Liquid (each inner)	1088 lb *(493 kg)*	None
	—Cast Iron (each inner)	1570 lb *(712 kg)*	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 16.5L-16.1; 8; 32 *(220)*	Two 16.5L-16.1; 8; 32 *(220)*
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	40 lb *(18 kg)*	None
Height of Drawbar		21 in *(535 mm)*	21 in *(535 mm)*
Static Weight with Operator	—Rear	16370 lb *(7425 kg)*	11055 lb *(5014 kg)*
	Front	5060 lb *(2295 kg)*	4980 lb *(2259 kg)*
	Total	21430 lb *(9720 kg)*	16035 lb *(7273 kg)*

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump return was 162°F *(72.2°C)*. Four gears were chosen between 15% slip and 10 mph *(16.1 km/h)*.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1399.**

LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
W. E. SPLINTER
L. L. BASHFORD
Board of Tractor Test Engineers



Massey Ferguson MF 2805 Diesel

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Roy G. Arnold, Director

NEBRASKA TRACTOR TEST 1400 — BIG BUD 525/50 DIESEL 9 SPEED

DRAWBAR PERFORMANCE

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption			Temp. °F *(°C)*			Barom. inch Hg *(kPa)*
					gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Cooling med	Air wet bulb	Air dry bulb	
Maximum Available Power—Two Hours 3rd (L3) Gear											
406.48 *(303.11)*	26984 *(120.03)*	5.65 *(9.09)*	2100	4.04	27.340 *(103.493)*	0.471 *(0.287)*	14.87 *(2.929)*	179 *(81.4)*	73 *(22.8)*	84 *(28.9)*	28.930 *(97.692)*
75% of Pull at Maximum Power—Ten Hours 3rd (L3) Gear											
345.77 *(257.84)*	21462 *(95.47)*	6.04 *(9.72)*	2223	3.06	24.750 *(93.690)*	0.502 *(0.305)*	13.97 *(2.752)*	177 *(80.6)*	71 *(21.9)*	86 *(29.8)*	28.885 *(97.540)*
50% of Pull at Maximum Power—Two Hours 3rd (L3) Gear											
232.40 *(173.30)*	13995 *(62.25)*	6.23 *(10.02)*	2267	2.01	19.350 *(73.248)*	0.584 *(0.355)*	12.01 *(2.366)*	173 *(78.1)*	73 *(22.8)*	81 *(26.9)*	28.890 *(97.557)*
50% of Pull at Reduced Engine Speed—Two Hours 5th (L5) Gear											
233.97 *(174.47)*	14049 *(62.49)*	6.25 *(10.05)*	1652	1.93	15.605 *(59.071)*	0.467 *(0.284)*	14.99 *(2.954)*	173 *(78.3)*	75 *(23.9)*	88 *(31.1)*	28.875 *(97.507)*
MAXIMUM POWER IN SELECTED GEARS											
399.17 *(297.66)*	42216 *(187.79)*	3.55 *(5.71)*	2099	9.20	1st (L1) Gear			178 *(81.1)*	72 *(22.2)*	85 *(29.4)*	28.920 *(97.659)*
413.44 *(308.30)*	35554 *(158.15)*	4.36 *(7.02)*	2101	5.72	2nd (L2) Gear			178 *(81.1)*	72 *(22.2)*	85 *(29.4)*	28.930 *(97.692)*
421.49 *(314.30)*	28011 *(124.60)*	5.64 *(9.08)*	2097	4.16	3rd (L3) Gear			179 *(81.7)*	73 *(22.8)*	85 *(29.4)*	28.930 *(97.692)*
419.34 *(312.70)*	23303 *(103.66)*	6.75 *(10.86)*	2100	3.28	4th (L4) Gear			179 *(81.4)*	71 *(21.7)*	85 *(29.4)*	28.920 *(97.659)*
418.20 *(311.85)*	19919 *(88.60)*	7.87 *(12.67)*	2100	2.63	5th (L5) Gear			179 *(81.7)*	71 *(21.7)*	85 *(29.4)*	28.910 *(97.625)*
416.39 *(310.50)*	16655 *(74.08)*	9.38 *(15.09)*	2099	2.30	6th (L6) Gear			179 *(81.7)*	72 *(22.2)*	86 *(30.0)*	28.910 *(97.625)*
MAXIMUM PULL IN 3rd (L3) GEAR (TORQUE CONVERTER MODE)											
301.93 *(225.15)*	44927 *(199.85)*	2.52 *(4.06)*	2077	14.75	3rd (L3) Gear			182 *(83.1)*	74 *(23.3)*	83 *(28.3)*	28.890 *(97.557)*

LUGGING ABILITY IN 3rd (L3) GEAR

Crankshaft Speed rpm	2097	1886	1684	1467	2113	2087
Pull—lbs *(kN)*	28011 *(124.60)*	31071 *(138.21)*	33963 *(151.08)*	35054 *(155.93)*	38360 *(170.63)*	43377 *(192.95)*
Increase in Pull %	0	11	21	25	37	55
Power—Hp *(kW)*	421.49 *(314.30)*	417.75 *(311.51)*	404.56 *(301.68)*	362.25 *(270.36)*	344.70 *(257.04)*	323.73 *(241.41)*
Speed—Mph *(km/h)*	5.64 *(9.08)*	5.04 *(8.11)*	4.47 *(7.19)*	3.88 *(6.24)*	3.37 *(5.42)*	2.80 *(4.50)*
Slip %	4.16	4.63	5.41	5.72	6.78	10.67

TRACTOR SOUND LEVEL W/CAB	dB(A)
Maximum Available Power—Two Hours	74.0
75% of Pull at Maximum Power—Ten Hours	74.5
50% of Pull at Maximum Power—Two Hours	75.5
50% of Pull at Reduced Engine Speed—Two Hours	74.0
Bystander in 6th (L6) gear	94.0

TIRES, BALLAST AND WEIGHT		Tested Without Ballast
Rear Tires	—No., size, ply & psi *(kPa)*	Four 30.5L-32; 10; inner 14 *(95)* outer 12 *(85)*
Ballast	—Liquid (each)	None
	—Cast Iron (each)	None
Front Tires	—No., size, ply & psi *(kPa)*	Four 30.5L-32; 10; inner 16 *(110)* outer 14 *(95)*
Ballast	—Liquid (each)	None
	—Cast Iron (each)	None
Height of Drawbar		17.5 in *(445 mm)*
Static Weight with Operator	—Rear	21260 lb *(9644 kg)*
	Front	30660 lb *(13907 kg)*
	Total	51920 lb *(23551 kg)*

Department of Agricultural Engineering

Dates of Test: June 29 to July 9, 1981.

Manufacturer: BIG BUD TRACTORS, INC., Box 1111, Havre, Montana 59501

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 46.3 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60°** *(15°/15°)* 0.8418 **Fuel weight** 7.009 lbs/gal *(0.840 kg/l)* **Oil SAE** 15W-40 **API service classification** SB/SE-CA/CD **To motor** 8.760 gal *(33.160 l)* **Drained from motor** 7.567 gal *(28.644 l)* **Transmission lubricant** SAE 10 hydraulic transmission oil **Hydraulic oil** Union ISO VG 46 or equivalent **Final drive lubricant** SAE 80W-140 **Total time engine was operated** 36.0 hours.

ENGINE: Make Cummins Diesel **Type** six cylinder vertical with turbocharger and intercooler **Serial No.** 31121666 **Crankshaft** lengthwise **Rated rpm** 2100 **Bore and stroke** 6.25" × 6.25" *(158.8 mm × 158.8 mm)* **Compression ratio** 15.5 to 1 **Displacement** 1150 cu in *(18845 ml)* **Starting system** 24 volt **Lubrication** pressure **Air cleaner** two paper elements with aspirator **Air compressor** direct engine drive **Oil filter** two full flow cartridges and one bypass element **Oil cooler** engine coolant heat exchangers for crankcase and torque converter oil **Fuel filter** two paper cartridges **Muffler** vertical **Cooling medium temperature control** two thermostats.

CHASSIS: Type four wheel drive with duals **Serial No.** CT35C30511157 **Tread width** rear 91" *(2310 mm)* to 159.5" *(4050 mm)* front 91" *(2310 mm)* to 159.5" *(4050 mm)* **Wheel base** 150" *(3810 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 88.5" *(2250 mm)* Vertical distance above roadway 47.5" *(1205 mm)* Horizontal distance from center of rear wheel tread 0" *(0 mm)* to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio 6 range power shift with torque converter and automatic lockup **Advertised speeds mph** ***(km/h)*** first 3.8 *(6.1)* second 4.5 *(7.2)* third 5.7 *(9.2)* fourth 6.8 *(10.9)* fifth 7.9 *(12.6)* sixth 9.3 *(15.0)* seventh 9.8 *(15.7)* eighth 14.7 *(23.7)* ninth 20.2 *(32.6)* reverse 3.8 *(6.1)*, 9.8 *(15.7)* **Clutch** none **Brakes** expanding shoe pneumatically operated by foot pedal **Steering** hydrostatic and articulated **Turning radius** (on concrete surface without brake) right 325" *(8.26 m)* left 325" *(8.26 m)* **Turning space diameter** (on concrete surface without brake) right 680" *(17.28 m)* left 680" *(17.28 m)* **Power take-off** none.

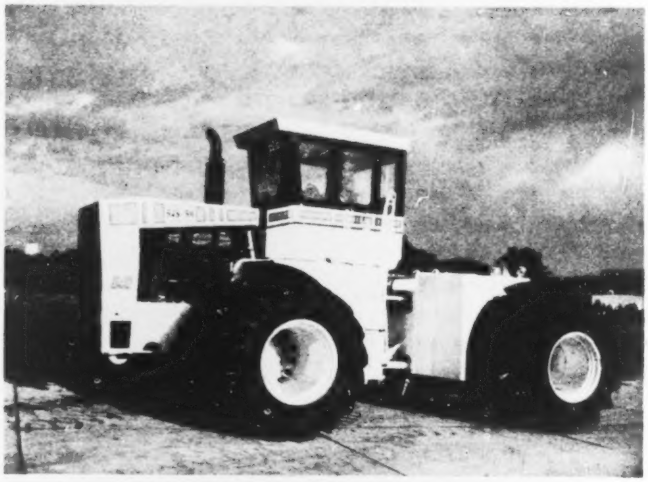
REPAIRS and ADJUSTMENTS: During the limber up period, the hydraulic steering suction line came in contact with the drive line and wore through. It was replaced and secured.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump was 134°F *(56.7°C)*. Six gears were chosen between 15% slip and 10 mph *(16.1 km/h)*. The transmission shifted to torque converter mode after the third step of the lugging run, resulting in increased engine speed.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1400.**

LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
W. E. SPLINTER
L. L. BASHFORD
Board of Tractor Test Engineers



Big Bud 525/50 Diesel

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Roy G. Arnold, Director

Nebraska Tractor Tests Summarized (Tests from 1972 through 1981)

					ENGINE										–FUEL CONSUMPTION (HP Hours Per Gallon) @:–				
																PTO	–Varying Drawbar Power–		
MAKE AND MODEL OF TRACTOR	Test No.	Fuel Used	Weight With Ballast	Lbs. Ballast Carried	No. of Cyl-inders	Bore and Stroke	Dis-place-ment Cu. in.	Rated RPM Dwbr.	Max. PTO HP @ Rated Engine RPM	Std. PTO RPM	Max. PTO HP @ Std. PTO RPM	Max. Draw-bar HP	MPH @ Max. Dwbr. HP	Max. Lbs. Pull	Max. PTO HP @ Std. PTO RPM	Average @ Varying Power	Max. Avail-able Power	75% of Pull Max. Power	50% of Pull @ Max. Power
Allis-Chalmers																			
175	1156	Gas.	8400	2010	4	4.000x4.500	226	1800	60.88	540	56.02	53.17	5.50	6875	11.78	9.44	10.22	9.64	8.20
5020	1270	Die.	3358	1298	2	3.62x3.74	77	2500	21.79	540	20.78	18.05	5.74	2346	13.99	10.99	11.07	10.51	8.62
5030	1271	Die.	3876	1346	2	3.82x3.94	90.1	2500	26.42	540	25.61	23.92	4.26	3389	13.82	11.28	11.64	11.48	9.68
5040	1230	Die.	6240	2180	3	3.740x4.330	143	2400	40.05	540	36.69	35.86	5.00	4837	15.47	11.80	12.58	12.74	10.44
5050 Diesel	1240	Die.	7690	3280	3	4.055x4.330	168	2700	51.46	540	47.16	45.22	5.68	6075	16.10	12.42	12.58	13.01	11.24
6060 8 Speed	1397	Die.	8945	2480	4	3.876x4.250	200	2300	63.83	540	64.90	52.24	4.83	6846	16.26	12.07	13.27	11.99	10.10
6080 12 Speed	1398	Die.	11790	4200	4	3.876x4.25	200	2300	83.66	1000	74.49	72.32	5.74	9003	15.70	13.14	14.27	12.81	10.93
7000PS Diesel	1195	Die.	12580	3030	6	3.875x4.250	301	2200	106.44	1000	105.85	92.64	6.08	9907	15.70	12.21	13.21	12.27	10.16
7010PD Die. 20 Speed	1345	Die.	12790	1530	6	3.875x4.25	301	2300	106.53	1000	107.52	91.44	6.05	9426	15.48	11.57	12.59	11.48	9.68
7010PS Die. 12 Speed	1346	Die.	12740	1365	6	3.875x4.25	301	2300	106.72	1000	106.33	91.61	6.11	9516	15.43	11.74	12.43	11.35	9.58
7020 Power Shift	1259	Die.	15610	3840	6	3.875x4.250	301	2300	123.79	1000	123.50	105.36	6.59	12001	16.01	12.45	13.10	12.25	10.34
7020 Power Director	1260	Die.	15655	4085	6	3.875x4.250	301	2300	123.85	1000	125.51	107.36	6.63	11964	16.08	12.12	13.09	12.08	10.13
7030 Diesel	1119	Die.	16560	4130	6	4.250x5.000	426	2300	130.98	1000	131.14	113.28	4.94	12610	15.45	11.76	12.92	11.90	9.91
7040 Diesel	1166	Die.	17380	5585	6	4.250x5.000	426	2300	136.49	1000	136.26	117.12	4.77	13619	15.35	11.78	12.94	11.86	9.80
7040PS Diesel	1196	Die.	17355	4977	6	4.250x5.000	426	2300	136.30	1000	136.15	117.75	4.61	13547	15.51	11.95	13.05	12.29	10.39
7045 Power Director	1261	Die.	18980	4745	6	4.250x5.000	426	2300	146.18	1000	146.46	127.84	7.04	15430	14.62	11.26	12.16	11.40	9.72
7045 Powershift Diesel	1308	Die.	18990	4390	6	4.25x5.00	426	2300	146.88	1000	146.67	127.61	6.92	15449	14.92	11.32	12.58	11.71	9.62
7050 Diesel	1120	Die.	19530	5005	6	4.250x5.000	426	2300	156.49	1000	156.63	135.11	5.47	16206	16.04	12.69	13.47	12.67	10.53
7060 Diesel	1167	Die.	20490	6500	6	4.250x5.000	426	2300	161.51	1000	160.44	140.59	6.94	17370	15.99	12.71	13.63	12.75	10.55
7060PS Diesel	1197	Die.	20560	5915	6	4.250x5.000	426	2300	161.42	1000	161.65	144.13	4.92	17851	16.08	12.76	13.80	12.98	10.79
7080 Diesel	1168	Die.	21720	7115	6	4.250x5.000	426	2550	181.51	996	181.51	153.78	4.58	18478	15.71	12.24	13.23	12.11	10.02
7580 4WD	1229	Die.	25000	1490	6	4.250x5.000	426	2550	186.35	996	186.35	160.79	6.91	23310	14.81	11.47	12.22	11.39	9.40
8550 Diesel	1262	Die.	29360	2320	6	5.250x5.625	731	2500	253.88	998	253.88	224.18	5.83	26220	14.57	10.94	12.47	11.45	9.35
Belarus																			
MTZ 80 Diesel	1139	Die.	11575	3735	4	4.331x4.921	290	2200	74.79	1000	73.88	65.64	5.08	8141	15.30	13.07	13.12	13.12	11.32
250 Diesel	1183	Die.	5490	939	2	4.134x4.724	127	1800	24.95	540	25.02	21.81	4.54	2280	15.56	13.23	13.19	13.20	11.80
T25A Diesel	1200	Die.	5490	939	2	4.134x4.724	127	1800	28.70	540	28.15	24.46	4.51	2570	13.95	13.46	12.21	13.48	11.94
1500 Diesel 12 Speed	1333	Die.	19885	1120	6	5.118x4.528	558	2100	168.76	1000	169.63	151.96	5.31	19311	16.48	13.69	14.53	13.98	12.25
7100 Diesel 16 Speed	1334	Die.	32460	None	12	5.118x5.512	1360	1900	269.62	1003	269.62	259.46	4.78	30845	15.85	13.26	14.82	14.35	12.56
Big Bud																			
525/50 9 Speed	1400	Die.	---------	-------	6	6.25x6.25	1150	2100	DNA	DNA	DNA	421.49	5.64	42216	DNA	DNA	14.87	13.97	12.01
David Brown																			
885 Gasoline	1143	Gas.	6550	2530	3	3.939x4.000	146.1	2200	39.26	1000†	37.26	32.92	4.61	5308	10.96	8.19	7.55	7.00	7.21
855 Diesel	1137	Die.	6480	2125	3	3.939x4.500	164.4	2200	43.20	1000†	40.87	37.16	4.57	5135	16.61	14.03	13.85	13.73	12.67
990 Diesel	1144	Die.	9350	4690	4	3.939x4.000	194.9	2200	53.77	1000†	50.48	46.34	5.54	7335	15.53	13.23	13.37	12.91	11.14
995 Diesel	1136	Die.	9475	4325	4	3.939x4.500	219	2200	58.77	1000†	55.33	50.42	5.44	7317	16.60	13.94	13.78	13.60	12.40
1210 Diesel	1142	Die.	10440	4640	4	3.939x4.500	219	2300	65.98	1000†	59.40	57.23	6.16	8097	16.40	14.43	13.61	14.36	12.93
1212 Diesel	1138	Die.	10435	4030	4	3.939x4.500	219	2300	65.36	1000†	58.25	54.10	6.92	8137	15.35	13.84	12.56	13.27	11.82
Case																			
870 Manual Diesel	1149	Die.	13510	3435	4	4.625x5.000	336	2100	80.20	1000	77.93	71.09	5.23	10047	14.52	12.13	12.42	12.53	10.88
870 Power Shift	1150	Die.	13760	3665	4	4.625x5.000	336	2100	80.49	1000	76.52	71.04	4.39	10030	13.64	11.60	11.49	12.04	10.60
1190 Manual	1378	Die.	6780	2160	3	3.939x4.500	165	2200	43.09	540	38.54	36.60	7.60	4620	14.99	13.09	12.22	12.59	11.39
1270	1103	Die.	17625	4185	6	4.375x5.000	451	2100	126.70	1000	126.60	109.77	6.79	12690	14.52	11.05	12.13	11.55	9.81
1270	1160	Die.	18910	3440	6	4.375x5.000	451	2100	135.39	1000	135.41	121.83	6.46	15648	14.23	11.14	12.16	11.49	9.88
1290 Manual	1379	Die.	9320	2750	4	3.939x4.000	195	2200	53.73	540	47.80	46.41	4.97	6851	15.20	13.34	12.41	12.90	11.68
1370	1102	Die.	20960	5670	6	4.625x5.000	504	2100	142.51	1000	143.64	123.01	4.78	16609	15.37	11.45	12.73	11.82	10.16
1370 Diesel	1148	Die.	20290	4945	6	4.625x5.000	504	2200	155.56	1000	156.32	134.25	5.00	16480	15.01	10.95	12.04	10.91	9.11
1390 Manual	1380	Die.	9780	3160	4	3.939x4.500	219	2200	60.59	1000	58.40	52.16	4.92	7348	15.58	13.36	12.89	13.24	11.77
1410 Manual	1209	Die.	10910	3160	4	3.939x4.500	219	2300	80.88	540	79.35	69.25	5.32	7846	17.47	14.69	14.20	14.38	12.45

1410 Power Shift	1210	Die.	10990	3150	4	3.939x4.500	219	2300	80.61	540	76.21	67.98	7.90	7815	16.86	13.76	13.34	13.21	11.45
1490 Manual	1381	Die.	11305	3600	4	3.939x4.500	219	2200	70.51	1000	68.75	60.45	5.63	8340	17.18	13.62	13.82	13.00	11.25
1490 Powershift	1382	Die.	11060	2635	4	3.939x4.500	219	2200	70.91	1000	70.48	61.56	6.76	8405	16.42	12.36	13.12	12.01	10.20
1570	1218	Die.	20350	4060	6	4.625x5.000	504	2100	180.41	1003	180.41	152.96	5.02	17115	15.09	12.47	12.72	12.46	10.88
1690 Manual (1)	1383	Die.	12470	3715	6	3.939x4.500	329	2300	90.39	1000	87.76	78.08	4.27	10536	15.95	13.95	13.20	13.50	12.28
2090 Manual Diesel	1304	Die.	15030	3120	6	4.625x5.000	504	2100	108.74	998	108.74	95.31	7.10	11655	15.40	12.23	13.41	12.69	10.73
2090 Power Shift	1295	Die.	15190	3160	6	4.625x5.00	504	2100	108.29	998	108.29	93.95	6.56	11211	14.94	11.77	12.49	11.96	10.14
2290 Manual Diesel	1296	Die.	15400	2630	6	4.625x5.000	504	2100	128.80	998	128.80	109.36	5.32	12635	14.52	11.66	12.46	11.73	10.07
2290 Powershift Diesel	1297	Die.	15840	2140	6	4.625x5.000	504	2100	129.08	998	129.08	111.68	6.25	12749	14.52	11.53	12.65	11.37	9.77
2390 Powershift Diesel	1302	Die.	18710	3120	6	4.625x5.000	504	2100	160.72	1002	160.72	146.01	6.59	16020	15.23	12.41	13.20	12.66	10.99
2470	1114	Die.	20485	None	6	4.625x5.000	504	2200	174.20	1008	174.20	154.24	5.67	18050	15.22	12.31	13.30	12.55	10.86
2590 Powershift Diesel	1303	Die.	20500	4760	6	4.625x5.000	504	2100	180.38	1003	180.38	159.01	6.57	17865	15.53	12.97	13.42	13.03	11.67
2670 Diesel	1165	Die.	25260	4450	6	4.625x5.000	504	2200	219.44	1008	219.44	194.60	5.28	23618	15.29	12.59	13.42	12.60	10.88
2870 Diesel	1241	Die.	28150	3050	6	5.000x5.710	673	2200	252.10	1009	252.10	219.61	5.72	26386	15.45	12.01	12.98	12.37	10.40
M-B 4/94	1211	Die.	13110	4620	6	3.819x5.039	346	2550	73.33	1000†	70.17	66.33	5.33	10558	15.13	10.68	12.55	11.65	9.49
4490 Diesel	1328	Die.	22450	1610	6	4.625x5.000	504	2200	175.20	1000	175.20	153.30	5.65	21400	15.27	12.36	13.30	12.52	10.87
4690 Diesel	1329	Die.	25230	2920	6	4.625x5.000	504	2200	219.62	1000	219.62	195.60	5.97	24564	15.26	12.76	13.39	12.84	11.21
4890 Diesel	1330	Die.	28460	2710	6	5.00x5.71	673	2200	253.41	1000	253.41	224.81	5.96	27627	16.32	13.02	14.19	13.27	11.36

(1) With mechanical front wheel drive.

John Deere

830 Diesel	1146	Die.	5714	1338	3	3.860x4.330	152	2400	35.30	540	32.62	28.46	5.19	4252	14.74	11.37	11.84	11.03	9.09
850	1280	Die.	3528	992	3	3.15x3.35	78	2600	22.27	540	20.66	18.92	4.90	2699	14.26	11.51	11.23	11.22	10.21
950	1281	Die.	3615	803	3	3.54x3.54	105	2400	27.36	540	28.05	23.46	4.98	3056	14.68	12.36	12.42	12.23	10.63
1050 Diesel	1327	Die.	4140	730	3	3.54x3.54	105	2400	33.41	540	33.42	28.15	5.27	3466	15.46	12.36	12.34	11.99	10.13
1530 Diesel	1147	Die.	6863	1909	3	4.020x4.330	164	2500	45.38	540	41.36	38.86	5.58	5139	14.28	11.20	12.04	11.47	9.78
2040 Diesel	1191	Die.	6420	1620	3	4.020x4.330	164	2500	40.86	540	37.62	34.15	5.64	4634	15.50	11.18	11.87	11.15	9.51
2040 Diesel 8 Speed	1350	Die.	6500	1465	3	4.19x4.33	179	2500	41.25	540	40.53	33.31	5.63	4873	15.62	11.73	12.02	11.35	9.03
2040 8 Speed TSS (1)	1393	Die.	6040	265	3	4.19x4.33	179	2500	40.44	540	40.22	33.21	5.16	5541	14.87	10.93	11.69	10.71	8.76
2240 Diesel	1192	Die.	7340	2390	3	4.190x4.330	179	2500	50.37	540	46.78	41.28	5.54	5433	15.20	11.08	11.57	11.18	9.51
2240 8 Speed TSS (1)	1394	Die.	6205	310	3	4.19x4.33	179	2500	50.90	540	49.20	42.13	5.08	5777	15.32	11.75	11.98	11.45	9.78
2630	1157	Die.	8430	2630	4	4.190x5.000	276	2500	70.37	540	69.02	58.15	5.38	6470	16.01	10.89	12.10	10.98	8.95
2840 Diesel	1249	Die.	10500	1695	6	4.020x4.330	329	2500	80.65	1000	76.27	67.47	6.21	8386	16.02	11.52	12.36	11.57	9.59
2940 Diesel 16 Speed	1351	Die.	10650	1215	6	4.19x4.33	359	2500	81.17	1000	81.46	67.98	4.64	7601	15.91	11.73	12.81	11.91	9.91
4030 Quad-Range	1111	Die.	10150	970	6	4.02x4.330	329	2500	80.33	1000	77.72	68.76	6.10	7512	15.40	10.69	11.71	10.99	8.92
4040 Diesel	1267	Die.	12055	1165	6	4.250x4.750	404	2200	90.80	1002	90.80	77.85	6.36	8936	13.49	10.59	11.24	10.96	9.21
4040 Syncro Range	1359	Die.	12090	1600	6	4.25x4.75	404	2200	90.31	1002	90.31	77.04	8.14	9035	13.87	10.85	11.68	11.29	9.70
4040 Power Shift	1360	Die.	12080	1590	6	4.25x4.75	404	2200	90.79	1000	90.88	78.54	4.45	9195	13.54	10.79	11.50	11.35	9.55
4230 Quad-Range	1112	Die.	14150	3250	6	4.250x4.750	404	2200	100.32	1002	100.32	86.36	6.65	11116	14.10	11.61	12.02	11.92	10.10
4240 Diesel	1266	Die.	14090	1695	6	4.5625x4.75	466	2200	110.94	1002	110.94	95.18	5.42	11492	14.33	11.09	12.05	11.35	9.52
4240 Syncro Range	1361	Die.	14240	2430	6	4.56x4.75	466	2200	110.81	1002	110.81	95.40	4.90	12240	14.17	11.08	12.00	11.47	9.81
4240 Power Shift	1362	Die.	14260	2440	6.	4.56x4.75	466	2200	111.06	1000	111.43	95.65	4.51	12450	14.39	11.25	12.13	11.65	10.13
4430 Quad-Range	1110	Die.	15060	3710	6	4.250x4.750	404	2200	125.88	1002	125.88	108.46	6.58	12032	15.56	12.00	12.94	11.96	10.17
4440 Diesel	1265	Die.	15540	2270	6	4.5625x4.75	466	2200	130.58	1002	130.58	112.56	5.02	13392	15.21	11.73	12.69	11.83	9.90
4440 Pwr Shift	1357	Die.	15775	2656	6	4.56x4.75	466	2200	130.41	1010	130.41	114.16	4.53	13738	15.32	11.83	13.15	12.22	10.60
4630 Power Shift	1113	Die.	16250	None	6	4.250x4.750	404	2200	150.66	995	150.66	134.56	10.26	14478	15.68	12.43	13.34	12.28	10.59
4640 Diesel	1264	Die.	18120	None	6	4.5625x4.75	466	2200	156.30	995	156.30	134.70	6.45	15362	15.61	12.29	13.30	12.15	10.32
4640 Power Shift	1358	Die.	18585	2804	6	4.56x4.75	466	2200	155.96	1000	157.01	137.04	4.81	15989	15.87	12.17	13.53	12.55	10.78
4840 Diesel	1263	Die.	20370	2240	6	4.5625x4.75	466	2200	180.63	1000	181.63	157.09	4.76	17307	15.85	12.47	13.35	12.54	10.76
6030	1100	Die.	18180	None	6	4.750x5.000	531	2100	175.99	1024	175.99	155.42	6.65	15303	15.82	12.70	13.52	12.72	11.04
7520	1101	Die.	22320	None	6	4.750x5.000	531	2100	175.82	1005	175.82	165.21	5.69	22517	15.18	12.37	13.76	12.82	10.97
8430 Diesel	1179	Die.	23100	290	6	4.563x4.750	466	2100	178.16	993	178.16	160.39	5.56	22503	15.12	11.98	13.44	12.64	10.72
8440 Diesel	1323	Die.	26590	None	6	4.563x4.75	466	2100	179.83	993	179.83	163.26	4.97	25383	15.86	12.55	14.29	13.06	11.25
8630 Diesel	1180	Die.	26480	1950	6	5.125x5.000	619	2100	225.59	993	225.59	202.31	4.58	26443	15.34	12.27	13.67	12.80	10.78
8640 Diesel	1324	Die.	28270	None	6	5.125x5.00	619	2100	228.75	993	228.75	208.38	4.63	27782	15.61	12.40	14.06	13.14	11.16

(1) With mechanical front wheel drive.

Deutz

D4506	1131	Die.	7390	2880	3	3.940x4.720	172.5	2300	43.15	540	42.17	37.07	4.68	5472	18.01	14.12	14.49	14.05	12.46
5506	1104	Die.	9780	4490	4	3.940x4.720	230	2300	56.08	540	52.88	48.84	3.84	6996	17.77	13.84	14.37	13.69	12.06
6006	1091	Die.	11250	4920	4	3.940x4.720	230	2300	66.25	1000	63.93	58.15	7.02	8623	15.26	13.53	13.02	13.64	11.75
D6206	1219	Die.	8780	3410	4	3.937x4.724	230	2050	60.23	540	57.00	52.41	6.04	6944	17.58	15.43	15.10	15.34	14.05
D6806	1220	Die.	11000	4605	4	3.937x4.724	230	2300	68.18	540	62.52	61.87	7.15	9095	16.55	14.73	14.63	15.05	13.52
10006	1105	Die.	14440	6060	6	3.940x4.720	345	2400	105.04	1000	101.19	91.13	9.50	9979	14.39	13.46	12.14	13.52	11.70

Nebraska Tractor Tests Summarized (Tests from 1972 through 1981)

					ENGINE										—FUEL CONSUMPTION (HP Hours Per Gallon) @:—				
MAKE AND MODEL OF TRACTOR	Test No.	Fuel Used	Weight With Ballast	Lbs. Ballast Carried	No. of Cyl-inders	Bore and Stroke	Dis-place-ment Cu. in.	Rated RPM Dwbr.	Max. PTO HP @ Rated Engine RPM	Std. PTO RPM	Max. PTO HP @ Std. PTO RPM	Max. Draw-bar HP	MPH @ Max. Dwbr. HP	Max. Lbs. Pull	Max. PTO HP @ Std. PTO RPM	PTO Average @ Varying Power	—Varying Drawbar Power— Max. Avail-able Power	75% of Pull Max. Power	50% of Pull @ Max. Power
Deutz Cont.																			
13006	1092	Die.	15980	6375	6	3.940x4.720	345	2400	125.71	1000	133.27	114.85	8.47	10677	17.39	14.10	14.36	13.87	12.07
D13006	1130	Die.	16125	4075	6	3.940x4.720	345	2400	125.77	1000	126.19	110.24	5.74	13509	17.71	14.00	14.97	13.83	11.95
DX-90 Diesel	1305	Die.	13150	3210	5	3.94x4.72	287	2300	84.47	1000	80.82	74.19	6.53	8786	16.45	14.15	13.81	14.07	12.39
DX-110 Diesel	1306	Die.	14940	2360	6	3.94x4.72	345	2300	100.29	1000	93.61	90.82	7.00	11773	15.10	13.71	13.52	14.03	12.60
DX-160 Diesel	1307	Die.	18710	3870	6	4.02x4.92	374	2200	145.41	1000	140.99	124.81	6.41	15172	17.82	14.47	14.56	13.95	11.93
Fiat																			
420	1293	Die.	6035	2115	3	3.74x4.33	143	2200	41.34	540	37.45	37.71	5.65	5299	14.81	12.93	13.30	13.92	12.35
580	1292	Die.	9210	2580	3	4.055x4.33	168	2700	51.61	540	48.42	44.20	3.38	8899	14.93	12.59	12.14	12.70	10.50
780	1294	Die.	10230	2830	4	4.055x4.33	224	2500	70.36	540	66.30	64.43	4.06	7776	15.41	13.62	13.93	14.17	12.50
Ford																			
1600 Diesel	1228	Die.	3840	1150	2	3.543x3.937	77.6	2500	23.02	540	19.78	18.53	5.76	2634	14.14	11.82	11.26	11.45	9.72
1700 Diesel	1325	Die.	3725	1110	2	3.54x3.94	77.6	2500	23.26	540	23.02	20.21	5.54	2801	13.02	11.21	10.82	11.48	10.41
1900 Diesel	1326	Die.	4160	1225	3	3.35x3.31	87.2	2800	26.88	540	25.68	23.49	6.20	2964	12.58	10.38	10.41	10.89	9.32
2600 6-Speed	1204	Die.	5990	1550	3	4.200x3.800	158	2000	32.38	540	30.51	27.93	5.57	4591	14.88	11.51	12.27	11.74	10.22
2600 6-Speed	1206	Gas.	6000	1645	3	4.200x3.800	158	2000	32.78	540	31.03	28.25	5.57	4198	11.14	7.89	8.83	8.17	6.73
2600 8-Speed	1222	Die.	6000	460	3	4.200x3.800	158	2000	32.47	540	30.76	28.18	5.56	4452	14.62	11.18	11.94	11.22	9.18
2600 8-Speed	1207	Gas.	6000	1710	3	4.200x3.800	158	2000	34.18	540	32.07	30.20	5.49	4455	11.54	8.38	9.45	8.64	7.15
3600 6-Speed	1203	Die.	6860	2445	3	4.200x4.200	175	2000	40.49	540	37.64	34.47	5.96	5114	15.32	12.12	12.84	12.34	9.97
3600 6-Speed	1208	Gas.	6900	2665	3	4.200x4.200	175	2000	40.17	540	37.91	35.53	5.91	5158	11.23	8.07	9.29	8.77	7.05
3600 8-Speed	1221	Die.	6890	1300	3	4.200x4.200	175	2000	40.55	540	38.31	34.10	5.96	5277	15.33	12.40	12.93	12.51	10.36
3600 8-Speed	1226	Gas.	6900	1500	3	4.200x4.200	175	2000	40.62	540	38.29	35.90	5.93	5123	11.42	8.16	9.02	8.57	6.88
4100 8-Speed	1202	Die.	7500	2590	3	4.200x4.400	183	2000	45.46	540	41.13	41.14	4.63	5557	15.59	11.57	12.57	11.96	10.36
4600 8-Speed	1223	Die.	8220	2340	3	4.400x4.400	201	2200	52.44	540	46.31	45.57	5.24	6342	14.59	11.49	11.82	11.85	10.77
5600 8-Speed	1201	Die.	9690	3785	4	4.200x4.200	233	2100	60.46	540	56.85	52.22	5.49	7105	15.77	12.83	12.87	12.88	11.02
5600 16-Speed	1227	Die.	9690	2380	4	4.200x4.200	233	2100	58.46	540	56.00	49.79	5.36	7140	15.06	11.94	12.07	11.94	10.42
6600 8-Speed	1217	Die.	9660	3780	4	4.400x4.200	256	2100	70.56	1000	70.07	61.36	6.91	7131	15.43	12.86	12.28	12.71	11.35
6600 16-Speed	1224	Die.	9700	2680	4	4.400x4.200	256	2100	68.10	1000	68.05	58.74	5.22	7267	14.97	12.64	12.05	12.77	11.05
6700 16-Speed	1244	Die.	9690	1180	4	4.400x4.200	255	2100	68.94	1000	68.62	58.06	7.55	6787	13.77	12.23	11.24	12.38	11.16
7000	1093	Die.	10795	4580	4	4.400x4.200	256	2100	83.49	540	78.81	71.42	5.71	8138	16.64	13.53	13.21	12.86	11.51
7600 16-Speed	1225	Die.	10760	3320	4	4.400x4.200	256	2100	84.79	1000	85.16	67.95	5.61	7779	15.95	12.35	12.44	11.77	9.92
7700 16-Speed	1242	Die.	10800	2400	4	4.400x4.200	255	2100	84.38	1000	84.29	71.57	7.28	7688	15.24	11.65	11.92	11.21	9.71
8700 16-Speed	1245	Die.	14760	2490	6	4.400x4.400	401	2300	110.58	1000	99.56	100.12	6.94	11581	15.02	11.91	12.37	12.28	10.93
8600 Dual Power	1121	Die.	14790	3360	6	4.400x4.400	401	2300	110.69	1000	99.32	93.26	4.88	11363	15.69	12.84	12.71	12.74	11.19
9600 Dual Power	1122	Die.	18000	6140	6	4.400x4.400	401	2200	135.46	1000	128.46	116.40	6.65	12203	16.88	12.99	13.31	12.64	11.06
9700 16-Speed	1243	Die.	17480	4620	6	4.40x4.400	401	2200	135.64	1000	129.25	118.08	6.55	15010	15.95	11.77	12.63	11.97	10.34
TW-10 Diesel	1301	Die.	15190	2325	6	4.4x4.4	401	2300	110.24	1000	101.09	97.35	5.23	12006	14.86	11.50	12.17	11.91	10.20
TW-20 Diesel	1300	Die.	17180	3945	6	4.4x4.4	401	2200	135.60	1000	131.43	121.47	7.85	14155	16.22	11.78	13.08	12.04	10.09
TW-30 Diesel	1299	Die.	19830	5205	6	4.4x4.4	401	2200	163.28	1000	157.04	144.17	8.32	16553	16.76	12.49	13.67	12.58	10.79
FW-20	1291	Die.	31000	1385	8	4.625x4.125	555	2850	....	....	....	156.85	5.45	27155	....	....	12.12	11.69	10.15
FW30	1288	Die.	31720	410	8	5.500x4.750	903	2600	(1)	....	....	212.02	6.64	27803	....	....	13.71	12.24	10.08
					FW 30 without PTO							220.38	5.85	28302	....	....	14.16	12.73	10.96
FW40	1290	Die.	32950	2320	8	5.500x4.750	903	2600	....	....	....	238.78	6.60	28245	....	....	13.83	12.84	10.73
FW 60	1289	Die.	33970	2870	8	5.500x4.750	903	2600	....	....	....	285.57	7.45	29304	....	....	14.90	13.38	11.27
(1) Equipped with controlled, hydrostatic pto with 105 output horsepower at 1000 rpm.																			
Hesston Fiat																			
480-8 DT and 480-8 12 & 8 Speed	1385	Die.	7805	2485	3	3.937x4.33	158	2600	42.58	540	40.36	37.07	5.07	5265	16.93	12.27	13.34	12.54	10.64
680DT & 680 8 Speed	1352	Die.	10000	2660	4	3.937x4.331	211	2500	62.47	1000	61.20	53.65	5.44	6252	17.40	14.19	14.80	14.20	12.45
780 DT and 780 8-Speed	1386	Die.	10100	3920	4	4.055x4.33	224	2500	70.57	540	66.67	62.06	7.61	6965	16.71	13.96	13.72	13.86	12.26

880DT-5 &																		
880-5 12 Speed	1353	Die.	11560	2810	5	4.055x4.331	280	2500	81.32	1000	80.95	70.73	7.63	7554	16.27	13.23	13.50	13.44	11.65
980DT & 980 16 Speed	1354	Die.	12645	3795	6	3.937x4.33	316	2400	91.12	996	91.12	77.42	5.00	8351	16.90	13.92	14.25	13.59	12.25
International Harvester																			
Hydro 70 Gas	1154	Gas	10140	2265	6	3.750x4.390	290.8	2400	69.61	540	64.10	55.09	7.00	8427	11.10	7.17	7.65	6.75	5.48
Hydro 70 Die	1155	Die.	10430	1990	6	3.875x4.410	312	2400	69.51	540	65.41	54.11	7.00	8310	12.40	9.31	9.45	8.76	6.97
Hydro 84 Diesel	1316	Die.	9120	3115	4	3.937x5.062	246	2400	58.73	540	56.68	43.59	7.60	6572	14.01	10.50	10.13	9.82	8.34
Hydro 86 Diesel	1337	Die.	10710	2545	6	3.875x4.375	310	2400	70.89	540	66.64	54.10	4.03	8815	14.18	10.23	9.92	9.55	8.24
Hydro 100	1158	Die.	12765	635	6	4.300x5.000	436	2400	104.17	1000	101.30	82.13	6.42	9801	14.83	10.50	10.35	10.19	8.95
Hydro 186 Diesel	1257	Die.	13430	None	6	4.300x5.000	436	2400	105.02	1000	100.31	82.77	6.56	11312	13.68	10.06	9.83	9.84	8.46
284	1277	Gas.	3596	1166	4	2.756x2.992	71.3	2600	25.75	1000	24.33	20.64	4.02	2561	11.62	9.54	9.77	8.97	7.52
284 8 Speed	1387	Die.	3600	860	3	3.27x3.94	99	2600	2747	540	23.92	23.52	5.71	2523	14.40	10.91	10.99	10.53	9.18
354	1115	Gas.	5925	1890	4	3.375x4.000	143.1	1875	32.58	540	32.22	28.37	5.01	4674	10.36	7.99	9.03	8.55	7.23
454	1097	Die.	7470	2750	3	3.875x5.060	179	2200	40.47	1004	40.47	35.83	4.10	5583	14.68	11.48	12.87	11.85	10.07
454	1096	Gas.	7120	2720	4	3.375x4.390	157	2200	40.86	1004	40.86	35.24	4.13	5329	10.94	8.03	9.22	8.40	7.12
464 Gas	1126	Gas.	7355	2460	4	3.562x4.390	175	2400	45.74	540	43.64	42.20	4.51	5465	10.80	8.00	9.65	8.86	7.70
464 Diesel	1127	Die.	7570	2440	3	3.875x5.060	179	2400	44.42	540	41.73	39.97	4.53	5488	14.41	11.49	12.25	12.57	10.67
484 Utility Dsl.	1312	Die.	7710	2710	3	3.875x5.06	179	2200	42.42	540	41.79	38.06	4.78	5500	14.81	11.85	12.75	12.39	10.63
574	1099	Die.	8675	3525	4	3.875x5.060	238.6	2200	52.55	1004	52.55	46.95	4.40	6446	14.46	11.53	12.86	12.38	10.57
574	1098	Gas.	8250	3415	4	3.813x4.390	200.3	2200	52.97	1004	52.97	45.16	4.39	6360	11.25	8.55	9.63	9.05	7.43
584 Utility & Rowcrop	1313	Die.	8850	3185	4	3.875x4.38	206	2300	52.54	540	50.96	47.47	5.07	6859	15.23	12.34	13.41	12.95	11.10
666 Gas	1152	Gas.	10050	2360	6	3.750x4.390	290.8	2000	66.30	543	66.30	59.31	7.39	7981	11.95	8.45	10.08	9.04	7.27
666 Diesel	1151	Die.	10330	2130	6	3.875x4.410	312	2000	66.29	543	66.29	58.34	5.12	8012	14.24	11.60	12.60	11.98	10.16
674 Utility Gas	1128	Gas.	8330	3035	4	3.812x4.390	200	2400	58.53	540	56.01	53.48	7.04	6583	10.83	8.19	9.40	9.11	8.39
674 Utility Die	1129	Die.	8690	3040	4	3.875x5.060	238.6	2400	61.56	540	58.79	55.91	7.03	6833	15.25	12.16	13.52	13.11	11.31
684 Utility & Rowcrop	1314	Die.	9660	3825	4	3.875x5.06	239	2400	62.52	540	58.75	55.92	5.29	6858	15.55	12.21	13.27	13.02	11.28
686 Diesel (same as 666 Diesel)																			
686 Diesel 10 Speed	1336	Die.	10340	2360	6	3.875x4.375	310	2000	66.36	543	66.36	58.81	5.08	8043	16.07	13.16	13.93	13.27	11.53
Farmall 766	1117	Die.	12720	1380	6	3.875x5.085	360	2600	85.45	1000	85.66	74.54	6.48	9236	14.85	10.35	12.08	11.05	9.13
Farmall 766	1094	Gas.	11880	1480	6	3.750x4.390	290.8	2400	79.73	1000	73.96	71.44	4.77	8841	11.78	8.18	9.77	8.68	7.12
784 Rowcrop Diesel	1315	Die.	9920	3830	4	3.937x5.062	246	2400	67.48	1000	64.09	58.65	5.18	8105	16.06	12.75	13.25	12.77	11.07
786 16 Speed	1388	Die.	11930	340	6	3.875x5.0625	358	2400	80.20	1000	77.41	70.25	4.74	9968	15.72	11.40	12.72	11.88	10.00
884 Rowcrop	1376	Die.	10150	3945	4	3.937x5.51	268	2400	72.91	1000	69.76	65.39	5.54	8116	15.76	12.47	13.48	12.91	11.05
886 Diesel	1254	Die.	13040	970	6	3.875x5.085	360	2400	86.14	1000	83.16	76.16	4.70	10485	14.29	10.55	11.77	10.92	9.21
886 Diesel 16 Speed	1338	Die.	13450	1710	6	3.875x5.063	358	2400	86.57	1000	83.91	76.25	4.69	10807	16.01	11.77	12.97	12.21	10.62
886 Dsl. 16 Speed (1)	1339	Die.	13450	1710	6	3.875x5.063	358	2400	90.56	1000	88.23	80.13	4.69	10930	15.84	11.98	12.81	12.38	10.86
(1) Serial No. 2490208 U17026 and up.																			
Farmall 966 Hydro	1095	Die.	12875	1175	6	4.300x4.750	414	2400	91.38	1000	88.29	71.43	8.51	8909	13.80	9.33	9.63	9.19	7.94
966 Diesel	1123	Die.	13670	1970	6	4.300x4.750	414	2600	100.80	1000	101.52	88.94	6.58	10036	15.68	10.94	12.36	11.68	9.84
986 Diesel	1255	Die.	14000	970	6	4.300x5.000	436	2400	105.68	1000	104.18	94.60	4.98	12176	15.56	11.34	12.65	11.72	10.02
1066 Turbo Diesel	1124	Die.	15260	1945	6	4.300x4.750	414	2600	125.68	1000	119.20	108.87	7.03	13000	16.37	11.32	12.78	11.97	9.99
1086 w/Radial Tires	1247	Die.	15640	2915	6	4.300x4.375	414	2400	131.41	1000	133.67	116.28	4.40	13503	16.39	11.90	13.28	12.36	10.45
1086 w/Bias Ply Tires	1247	Die.	15640	3100	6	4.300x4.375	414	2400	131.41	1000	133.67	114.14	6.66	12137	16.39	11.90	12.83	12.08	10.52
1466 Turbo Diesel	1125	Die.	16660	2990	6	4.300x5.000	436	2600	145.77	1000	145.84	127.02	6.93	13673	17.03	11.83	13.03	12.01	10.35
Farmall 1468	1118	Die.	16310	2850	8	4.500x4.313	550	2600	145.49	1000	136.85	129.31	7.33	12932	15.93	12.40	13.87	13.22	11.17
1566 Turbo Dsl.	1174	Die.	18260	3065	6	4.300x5.000	436	2600	161.01	1000	162.31	140.35	5.64	15774	16.16	11.51	12.55	11.69	9.86
1568 Diesel	1175	Die.	17350	2400	8	4.500x4.313	550	2600	150.70	1000	147.79	133.79	5.69	14918	14.99	12.08	13.00	12.59	10.80
1586 w/Radial Tires	1248	Die.	17600	2480	6	4.300x5.000	436	2500	161.55	1000	156.09	140.65	5.55	16665	16.51	12.28	13.02	12.38	10.51
1586 w/Bias Ply Tires	1248	Die.	17600	3010	6	4.300x5.000	436	2500	161.55	1000	156.09	140.08	6.05	15124	16.51	12.28	12.74	12.38	10.54
3388 Diesel	1319	Die.	17850	430	6	4.300x5.000	436	2400	130.61	1000	128.59	114.42	6.67	16764	16.85	12.00	13.52	12.17	10.09
3588 Diesel	1320	Die.	18890	1270	6	4.300x5.350	466	2400	150.41	1000	152.07	130.94	6.65	17589	16.98	12.19	13.13	12.20	10.30
3788 12 Speed	1377	Die	20820	2200	6	4.300x5.350	466	2500	170.57	1000	166.39	146.43	7.49	19069	17.12	12.22	13.24	12.25	10.06
4166	1116	Die.	20010	3685	6	4.300x5.000	436	2400	150.63	1000	152.72	130.47	5.92	19434	16.84	11.80	13.01	11.88	9.93
4366 Turbo D	1153	Die.	23000	1310	6	4.300x5.350	466	2600	....	....	....	168.90	6.65	23138	....	....	12.34	11.98	10.34
4386 Diesel	1256	Die.	24930	None	6	4.300x5.350	466	2600	....	....	....	176.02	8.71	23321	....	....	12.43	11.92	10.18
4568	1216	Die.	29870	4120	8	5.3125x4.50	798	2600	....	....	....	235.72	6.76	27995	....	....	12.89	11.79	9.73
4786 Diesel	1317	Die.	34350	4150	8	5.313x4.500	798	2600	....	....	....	265.55	4.79	33468	....	....	12.80	11.92	9.86
Kubota																			
L185	1285	Die.	3370	1430	2	3.000x3.23	45.3	2800	15.33	540	14.07	13.03	5.57	1939	13.60	10.90	10.38	10.82	9.26
L185DT	1286	Die.	3415	1283	2	3.000x3.23	45.3	2800	15.45	540	14.16	12.65	3.94	2322	13.49	11.00	10.34	10.24	8.70
L225 Diesel	1145	Die.	3452	1457	3	3.000x3.23	68	2700	20.86	1000†	19.96	17.69	6.34	2015	14.25	11.12	10.71	10.78	9.36
L245	1283	Die.	3694	1498	3	3.000x3.23	68	2800	22.06	540	20.11	18.66	5.74	2067	13.98	11.07	10.74	10.70	9.16

Nebraska Tractor Tests Summarized (Tests from 1972 through 1981)

						ENGINE										—FUEL CONSUMPTION (HP Hours Per Gallon) @:—			
MAKE AND MODEL OF TRACTOR	Test No.	Fuel Used	Weight With Ballast	Lbs. Ballast Carried	No. of Cyl-inders	Bore and Stroke	Dis-place-ment Cu. in.	Rated RPM Dwbr.	Max. PTO HP @ Rated Engine RPM	Std. PTO RPM	Max. PTO HP @ Std. PTO RPM	Max. Draw-bar HP	MPH @ Max. Dwbr. HP	Max. Lbs. Pull	Max. PTO HP @ Std. PTO RPM	PTO Average @ Varying Power	—Varying Drawbar Power— Max. Avail-able Power	75% of Pull Max. Power	50% of Pull @ Max. Power
Kubota Cont.																			
L245DT	1284	Die.	3792	1410	3	3.000x3.23	68	2800	22.35	540	20.15	18.48	6.06	2419	14.33	11.21	10.88	10.67	9.22
L285 Diesel	1198	Die.	4030	1585	4	2.992x3.228	91	2400	26.45	540	23.58	22.94	6.62	3134	14.63	12.16	11.78	12.16	10.65
L295DT and L295 8 Speed	1370	Die.	4700	1805	3	3.23 x3.23	79.3	2800	26.46	540	24.91	22.82	4.34	3155	14.59	11.75	11.57	11.39	9.58
L305DT and L305 8 Speed	1371	Die.	5360	2070	3	3.23 x3.23	79.3	2800	26.21	540	25.14	22.96	4.16	3918	13.83	11.14	11.15	11.13	9.46
L345DT and L345 8 Speed	1372	Die.	5435	2000	4	3.00 x3.23	90.7	2800	29.35	540	28.80	26.72	4.62	3795	12.76	10.58	10.68	10.81	9.15
M4500DT & M4500 16 Speed	1348	Die.	7800	2635	6	3.23 x3.23	158.5	2600	49.72	540	44.49	42.[illegible]0	6.16	4812	15.19	12.22	11.90	12.02	10.77
M5500DT and M5500 16 Speed	136[illegible]	Die.	8710	3210	3	4.134x4.528	182	2400	53.99	540	49.18	46.96	5.51	6287	16.22	12.44	13.05	12.77	11.05
M7500DT & M7500 16 Speed	1349	Die.	9510	3530	4	4.134x4.528	243	2400	72.34	540	66.54	61.29	6.65	6327	17.83	14.15	13.93	14.20	12.40
Lamborghini																			
1056DT	1269	Die.	12050	1700	6	3.86x4.72	331	2220	92.13	1000	89.98	79.51	6.86	9135	15.16	13.02	12.45	12.74	10.93
Leyland																			
245 Diesel	1177	Die.	7850	1970	3	3.600x5.000	152.7	2250	39.73	540	36.38	35.09	4.47	5056	16.30	12.60	13.02	12.67	11.29
255 Diesel	1176	Die.	8610	2310	4	3.858x4.921	230	2200	47.91	540	43.85	43.00	6.58	5891	15.42	11.10	12.78	11.81	9.50
472 & 272 Die.9-Speed	1341	Die.	11990	4580	4	3.858x4.921	230	2200	63.52	540	58.50	53.27	5.91	7224	14.97	12.28	11.32	11.67	10.48
482 & 282 Die 9 Speed	1340	Die.	12000	4590	4	3.858x4.921	230	2200	74.28	540	70.86	61.19	5.86	7032	17.58	12.63	12.70	12.10	10.09
2100 Diesel	1178	Die.	13260	4350	6	3.860x4.920	344.7	2100	88.40	1000	83.30	75.70	4.95	8617	16.29	13.20	13.16	13.24	11.24
Long																			
360 Diesel	1298	Die.	6410	1930	3	3.74x4.33	143	2400	36.16	540	31.06	31.91	5.20	4808	14.41	11.97	12.45	12.13	10.48
R9500 Special	1107	Die.	13700	5530	6	3.875x5.000	354	2250	97.72	540	88.13	82.94	6.13	10216	16.21	13.25	13.02	13.10	11.14
U445	1108	Die.	7800	3320	3	3.740x4.330	143	2400	41.93	540	36.53	37.55	5.51	5910	13.40	12.01	11.84	13.29	11.93
U550	1109	Die.	9110	4540	4	3.740x4.330	190.7	2400	53.61	540	47.66	48.03	7.15	6944	15.10	12.41	13.09	13.21	11.76
900 Diesel and 910 Diesel	1163	Die.	12575	4375	4	4.33x4.72	278	2200	72.88	1000	72.86	62.50	6.53	7843	13.06	12.15	10.97	13.00	11.38
Massey-Ferguson																			
MF184-4 12 Speed	1392	Die.	7775	1395	4	3.875x5.0	236	2200	62.45	540	59.56	52.38	7.13	5500	16.41	12.37	12.61	12.11	10.69
MF205 6 Speed	1363	Die.	2840	935	2	3.46x3.46	65.2	2400	16.56	540	16.34	13.45	4.39	1995	12.97	9.62	9.98	9.65	8.03
MF205-4 6 Speed	1364	Die.	3120	905	2	3.46x3.46	65.2	2400	16.40	540	16.18	13.57	4.86	2131	12.83	9.69	10.04	9.57	8.02
MF210 12 Speed	1365	Die.	3550	1090	2	3.62x3.74	77.1	2500	21.96	540	21.23	18.08	5.81	2159	13.61	11.04	10.84	10.53	9.36
MF210-4 12 Speed	1366	Die.	3765	1030	2	3.62x3.74	77.1	2500	21.77	540	21.02	17.60	6.91	2158	13.18	10.75	9.97	10.44	8.61
MF220 12 Speed	1367	Die.	4220	1455	2	3.82x3.94	90.3	2500	26.37	540	25.52	23.95	4.34	3287	13.36	11.07	11.22	11.60	10.17
MF220-4 12 Speed	1368	Die.	4487	1307	2	3.82x3.97	90.3	2500	26.48	540	26.06	22.82	5.60	3496	14.09	11.56	11.09	11.55	10.02
MF230 Gasoline	1215	Gas.	4870	1030	4	3.375x4.062	145	2000	34.34	540	31.29	29.58	5.08	3717	11.85	8.72	9.89	8.90	7.85
MF230 Diesel	1214	Die.	5110	1110	3	3.600x5.000	153	2000	34.53	540	30.80	29.66	7.64	4030	18.18	14.81	15.06	14.74	12.87
MF235 Gasoline	1194	Gas.	5785	1655	4	3.375x4.062	145	2250	41.13	540	33.87	35.29	5.86	4294	10.49	7.99	8.69	8.07	6.69
MF235 Diesel	1187	Die.	5860	1725	3	3.600x5.000	153	2250	42.39	540	35.29	36.29	5.84	4281	16.78	13.52	13.80	13.39	11.56
245 Diesel	1251	Die.	6150	2100	3	3.600x5.000	153	2250	42.90	540	36.50	36.75	5.92	4279	16.25	12.72	12.43	12.79	11.13
245 Gasoline	1252	Gas.	6020	2120	4	3.375x4.062	145	2250	41.09	540	34.15	35.50	5.90	4298	11.74	9.07	9.50	9.07	7.88
MF255 Gasoline	1190	Gas.	7280	1140	4	3.875x4.500	212	2000	50.01	540	47.14	43.49	5.28	5668	10.91	8.00	8.94	8.54	6.72
MF255 Diesel	1189	Die.	7130	1160	4	3.600x5.000	203	2000	50.69	540	45.55	43.72	5.28	5257	15.88	13.32	13.44	13.36	12.24
255 12-Speed	1250	Die.	7310	895	4	3.875x5.000	236	2000	52.68	540	48.37	44.75	7.89	5591	16.92	12.70	13.34	12.82	11.03
MF265 Diesel	1188	Die.	8200	1815	4	3.875x5.000	236	2000	60.73	540	54.76	51.87	5.23	6248	15.88	13.44	13.52	13.51	12.16
MF275 Diesel	1193	Die.	9330	2720	4	3.975x5.000	248	2000	67.43	540	61.76	60.16	5.16	7292	14.18	12.51	13.04	13.22	11.63
MF285 Diesel	1171	Die.	11760	4110	4	4.500x5.000	318	2000	81.96	1000	81.96	70.53	7.77	8846	14.98	12.68	12.85	12.90	11.34

MF1085 Diesel	1133	Die.	14385	2845	4	4.500x5.000	318	2000	81.58	1000	81.58	70.76	5.58	10355	15.82	13.21	13.43	13.15	11.55
MF1105 Diesel	1132	Die.	16725	4405	6	3.875x5.000	354	2200	100.72	1000	96.43	86.26	4.36	11365	15.43	11.53	12.37	11.55	9.81
MF1135 Diesel	1135	Die.	18900	5350	6	3.875x5.000	354	2200	120.84	1000	118.47	106.52	4.56	13955	16.18	12.24	13.22	12.56	10.71
MF1155 Diesel	1134	Die.	20460	5554	8	4.250x4.75	540	2200	140.97	1000	134.11	124.90	4.40	15630	15.66	12.77	13.15	13.00	11.45
MF1505 Diesel	1172	Die.	20970	3010	8	4.500x5.000	636	2800	174.46	1000	175.95	154.10	6.98	17226	14.55	11.41	12.27	11.43	9.54
MF1805 Diesel	1173	Die.	22790	4790	8	4.500x5.000	636	2800	192.65	1000	191.60	170.17	6.95	18781	14.77	12.14	12.76	12.41	10.77
2675, 8-Speed	1321	Die.	14280	1930	6	3.875x5.0	354	2500	100.84	1000	95.00	86.18	5.91	10226	15.00	11.14	11.48	11.57	10.01
2675, 24-Speed	1309	Die.	14495	2065	6	3.875x5.0	354	2500	103.29	1000	96.67	87.47	5.09	9674	15.43	11.56	11.76	11.49	9.95
2705, 8-Speed	1322	Die.	16800	4295	6	3.875x5.0	354	2500	121.11	1000	114.44	101.47	6.17	12588	16.84	11.22	12.54	11.30	9.45
2705, 24-Speed	1310	Die.	17490	4895	6	3.875x5.0	354	2500	122.20	1000	115.85	104.23	5.30	13085	16.65	11.22	12.74	11.27	9.23
2745 Diesel	1311	Die.	19490	4300	8	4.25x4.75	539	2600	143.40	1000	132.21	125.17	5.51	15386	15.40	10.62	11.96	11.13	9.39
2775	1278	Die	20440	4210	8	4.63x4.75	640	2600	165.95	1000	149.86	143.70	5.72	17407	16.05	11.50	12.57	11.52	9.85
MF2775 8 Speed	1389	Die.	20170	4365	8	4.63x4.75	640	2600	162.09	1000	146.87	139.68	5.73	16766	15.78	11.19	12.45	11.68	9.56
2805 24-Speed	1258	Die.	21170	5540	8	4.630x4.750	640	2500	194.62	1000	181.77	160.72	7.10	17369	16.29	11.33	12.21	11.14	9.27
MF2805 8 Speed	1399	Die.	21430	5395	8	4.63x4.75	640	2500	190.81	1000	186.29	164.58	5.41	17647	16.59	10.97	12.41	11.43	9.58
4800 Die 12 & 18 Speed	1342	Die.	30520	None	8	5.5 x4.75	903	2600	179.31	1000	172.88	159.08	4.82	25294	15.10	10.12	12.13	10.73	8.39
4840 Die 12 & 18 Speed	1343	Die.	30920	None	8	5.5 x4.75	903	2600	210.67	1000	210.61	186.36	4.84	28191	15.57	10.77	12.41	11.25	9.32
4880 Die 12 & 18 Speed	1344	Die.	32450	1360	8	5.5 x4.75	903	2600	272.81	1000	267.38	244.57	6.54	29272	16.80	11.51	13.50	11.98	9.58
MF4900 18 Speed	1391	Die.	33940	2975	8	5.5 x4.75	903	2600	320.55	1000	323.88	278.78	6.53	30090	16.80	11.95	13.26	11.82	9.87
Minneapolis-Moline																			
G955	1161	Die.	12060	None	6	4.375x5.000	451	1800	98.38	1000	98.82	83.40	5.44	8374	13.92	11.93	11.26	11.76	10.29
G1355 Diesel	1141	Die.	18070	974	6	4.750x5.500	585	2200	142.62	1007	142.62	128.95	7.89	14178	15.21	12.47	13.61	12.85	11.23
Oliver																			
2255 Diesel	1140	Die.	17990	1583	8	4.500x4.500	573	2600	146.72	1000	147.65	126.13	5.70	14770	15.66	12.47	13.43	12.85	11.25
Same																			
Panter 4WD Diesel	1185	Die.	12000	2772	5	3.860x4.720	276	2200	80.02	1000	79.10	66.67	5.75	10389	14.79	12.74	12.40	12.30	10.00
Tiger 100 Diesel	1268	Die.	11620	2500	5	4.13x4.72	317	2200	90.45	1000	89.42	78.84	6.35	9116	15.48	13.22	12.41	13.08	11.26
Buffalo 4WD Diesel	1186	Die.	13795	3708	6	4.130x4.720	380	2200	104.94	1000	104.94	88.24	4.24	10941	15.23	12.78	12.47	12.44	10.76
Satoh																			
S650G	1106	Gas.	3640	1400	4	2.677x2.677	60.2	2800	22.03	1000†	20.37	18.78	3.96	2794	9.91	8.38	8.55	9.03	7.88
S750DD & S750D 9 Speed	1347	Die.	5550	1620	3	3.386x4.016	108.4	2500	33.45	540	28.11	28.99	5.93	4295	11.92	10.89	9.86	11.18	9.58
Steiger																			
Wildcat III ST-210 & RC-210	1237	Die.	22260	None	8	4.500x5.000	636	2800	....	....	....	171.44	5.84	21052	....	....	12.71	12.58	10.82
Bearcat II	1162	Die.	23020	1585	8	4.500x5.000	636	2800	....	....	....	180.69	6.57	22622	....	....	12.79	12.37	10.92
Bearcat III ST-220	1246	Die.	29380	None	6	5.500x6.000	855	2100	....	....	....	175.58	4.84	26936	....	....	13.24	12.60	11.04
Bearcat III PT225	1272	Die.	30825	None	6	4.75x6.00	638	2200	(1)	....	....	180.86	6.33	29749	....	....	12.02	10.80	9.29
Bearcat III 225 without PTO												187.59	5.58	29953	....	....	12.81	11.52	10.07
Cougar II	1170	Die.	27995	1305	6	4.750x6.000	638	2200	....	....	....	228.15	4.44	26432	....	....	13.15	12.77	11.59
Cougar III ST-250	1239	Die.	29800	None	6	4.750x6.000	638	2200	....	....	....	210.35	6.38	26612	....	....	12.74	11.90	10.36
Cougar III ST-251	1233	Die.	30840	None	6	5.500x6.000	855	2100	....	....	....	205.82	7.98	26880	....	....	14.74	13.69	11.60
Cougar III PT270	1273	Die.	32210	1495	6	4.75x6.00	638	2200	(1)	....	....	219.39	6.29	30122	....	....	12.73	11.81	10.23
Cougar III 270 without PTO												224.54	4.89	29950	....	....	12.97	12.45	10.76
Cougar III ST-270	1238	Die.	29930	None	6	4.750x6.000	638	2200	....	....	....	228.96	6.38	25371	....	....	13.32	12.62	10.96
Panther III ST-310	1235	Die.	30850	None	6	5.500x6.000	855	2100	....	....	....	261.78	7.90	26757	....	....	13.95	13.09	11.02
Panther III ST-325	1236	Die.	31080	None	6	5.400x6.500	893	2100	....	....	....	281.94	7.93	28189	....	....	14.82	14.19	12.64
Panther III PTA-325	1355	Die.	33960	3140	6	5.4x6.5	893	2100	....	....	....	274.88	5.34	31876	....	....	14.26	13.45	11.55
Panther III PT350	1274	Die.	34000	2855	8	5.4x4.75	903	2600	(1)	....	....	305.48	6.51	32276	....	....	14.91	13.75	11.32
Panther III 350 without PTO												311.64	7.38	32059	....	....	15.03	Not Tested	
Tiger II	1169	Die.	29930	2330	8	5.500x4.750	903	2600	....	....	....	270.21	6.73	28097	....	....	13.88	12.70	10.61
Tiger III ST450	1282	Die.	47370	4645	6	6.25x6.25	1150	1700	....	....	....	385.74	5.23	42715	....	....	15.57	Not Tested	

(1) Equipped with controlled hydrostatic pto with 105 output horsepower at 1000 rpm.

Versatile																			
555 Diesel	1331	Die.	25980	6330	8	4.625x4.125	555	2850	182.25	1000	184.35	154.20	4.56	23533	16.33	11.15	12.96	11.17	8.83
835 12 Speed	1356	Die.	28000	3720	6	5.5x6.0	855	2100	198.23	1009	198.23	179.07	6.13	26380	15.13	11.36	13.16	11.87	9.70
875 Diesel	1279	Die.	29500	4980	6	5.5x6.0	855	2100	248.07	1008	248.07	228.35	9.12	24457	15.45	11.76	13.60	12.28	10.40

Nebraska Tractor Tests Summarized (Tests from 1972 through 1981)

					ENGINE										—FUEL CONSUMPTION (HP Hours Per Gallon) @:—		—Varying Drawbar Power—		
MAKE AND MODEL OF TRACTOR	Test No.	Fuel Used	Weight With Ballast	Lbs. Ballast Carried	No. of Cyl-inders	Bore and Stroke	Dis-place-ment Cu. in.	Rated RPM Dwbr.	Max. PTO HP @ Rated Engine RPM	Std. PTO RPM	Max. PTO HP @ Std. PTO RPM	Max. Draw-bar HP	MPH @ Max. Dwbr. HP	Max. Lbs. Pull	Max. PTO HP @ Std. PTO RPM	PTO Average @ Varying Power	Max. Avail-able Power	75% of Pull Max. Power	50% of Pull @ Max. Power
Versatile Cont.																			
875 Diesel	1332	Die.	29480	4160	6	5.5x6.0	855	2100	247.16	1008	247.16	221.66	4.86	26795	16.06	12.02	14.35	12.53	10.34
895 Diesel, 12 Speed	1335	Die.	32500	7880	6	5.5x6.0	855	2100	....	....	....	261.63	6.45	29402	....	....	15.15	13.72	11.57
White																			
2-30 8 Speed	1373	Die.	3853	848	3	3.386x3.386	91.4	2600	28.33	540	24.50	25.81	8.35	2816	12.03	10.27	10.77	11.42	9.61
2-35 8 Speed	1374	Die.	3970	800	3	3.386x4.02	108.4	2400	32.84	540	30.94	30.37	8.00	2978	12.68	10.86	11.23	11.73	10.35
2-45 20 Speed	1395	Die.	6630	660	4	3.858x3.62	169.3	2250	43.73	540	36.62	37.32	3.97	4455	12.70	11.25	10.96	11.00	9.66
2-50 Field Boss	1231	Die.	6880	2325	3	3.940x4.330	158	2500	47.02	540	43.94	41.88	4.80	5640	15.80	13.03	13.26	13.49	11.97
2-60 Field Boss	1232	Die.	8990	3830	4	3.940x4.330	211	2400	63.22	540	54.35	54.78	5.07	7352	17.63	13.82	14.40	13.87	11.93
2-62 20 Speed	1396	Die.	6875	635	4	4.016x4.33	219	2200	61.46	540	54.25	51.63	6.05	4695	16.31	13.85	13.76	13.49	12.08
2-70 Diesel	1212	Die.	9630	1000	6	3.875x4.000	283	2200	70.71	994	70.71	59.47	6.40	7550	14.56	12.28	11.92	12.13	10.72
2-85 Diesel	1213	Die.	12280	580	6	3.875x5.000	354	2200	85.54	1007	85.54	71.93	8.13	9309	14.62	11.72	12.24	11.64	9.71
2-105 Field Boss	1181	Die.	11810	None	6	3.875x5.000	354	2200	105.61	1007	105.61	90.81	6.34	9212	15.76	12.02	12.89	11.95	10.00
2-135	1275	Die.	16360	2225	6	4.56x4.87	478	2200	137.64	1000	138.03	117.67	8.93	11907	14.91	11.38	12.31	11.42	9.73
2-150 Field Boss	1182	Die.	16940	None	6	4.750x5.500	585	2200	147.49	1007	147.49	127.49	5.63	15059	14.46	11.90	12.07	12.14	10.63
4-150 Field Boss	1159	Die.	16960	None	8	4.500x5.000	636	2800	151.87	1000	152.45	133.34	6.34	16925	15.09	11.45	12.46	11.34	9.21
2-155	1276	Die.	16650	None	6	4.56x4.87	478	2200	157.73	1000	162.37	139.68	9.04	14512	15.38	11.91	12.69	11.53	9.97
4-175 Field Boss	1375	Die.	....	....	8	4.5x5.0	636	2600	151.69	1000	151.29	133.72	6.39	19905	15.50	11.70	12.96	11.98	10.01
2-180	1287	Die.	18280	None	8	4.5x5.0	636	2800	181.89	1000	181.89	163.64	6.50	15499	14.38	11.66	12.85	12.48	10.56
4-180 Field Boss	1184	Die.	20600	None	8	4.500x5.000	636	2800	181.07	1000	182.30	156.54	4.59	20469	14.19	11.47	11.79	11.56	9.98
4-210 Field Boss	1318	Die.	23735	None	8	4.5x5.0	636	2800	182.44	1000	182.44	162.25	5.89	22934	14.26	11.53	12.34	12.10	10.25
Yanmar																			
YM240 Diesel	1199	Die.	3305	1355	2	3.543x3.543	70	2400	19.76	540	18.75	16.60	4.86	2442	15.05	12.64	12.35	11.95	10.37

†See complete test for data @ 540 rpm.

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